Volume XII.
Number 6.

JUNE, 1897.

$2.00 Per Year.
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TEXTILE WORLD.

With which is Incorporated the

INDUSTRIAL RECORD

The combined subscription of the Textile World and Industrial Record among textile manufacturing establishments is claimed to be larger than any other publication in this country, and comparison is invited.

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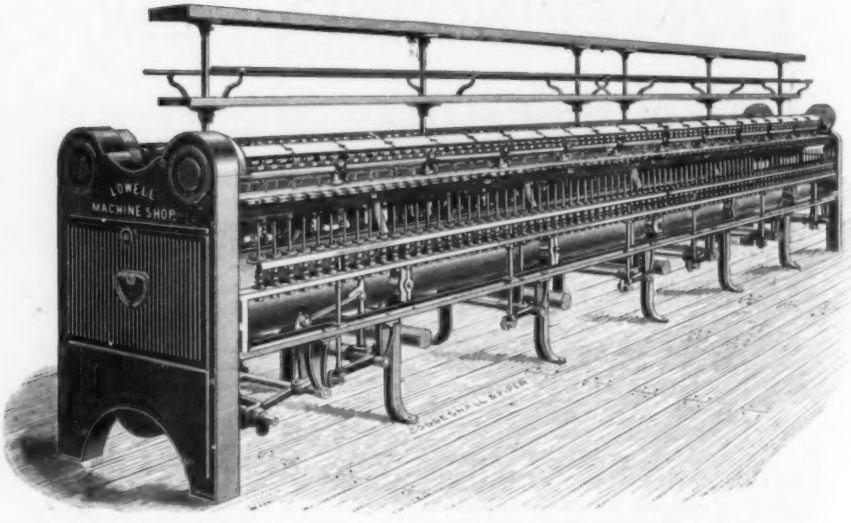

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Complete Equipment for Cotton Mills.

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nothing so bad but that
some fool will praise it, and
nothing so good but that
some fool will condemn it."

The Northrop Loom

Has now reached a stage where condemnation brings the latter end of our quotation to mind. : : : :

We have no fault to find on the whole, but we know of many instances where mills who cannot help but realize the advantages of our loom, still pursue the fatal policy of delay.

Hesitation in the face of facts is not only unwise but in the present case expensive. A mill buying these looms when we were first ready to take orders would have the extra cost well near annihilated by this time.

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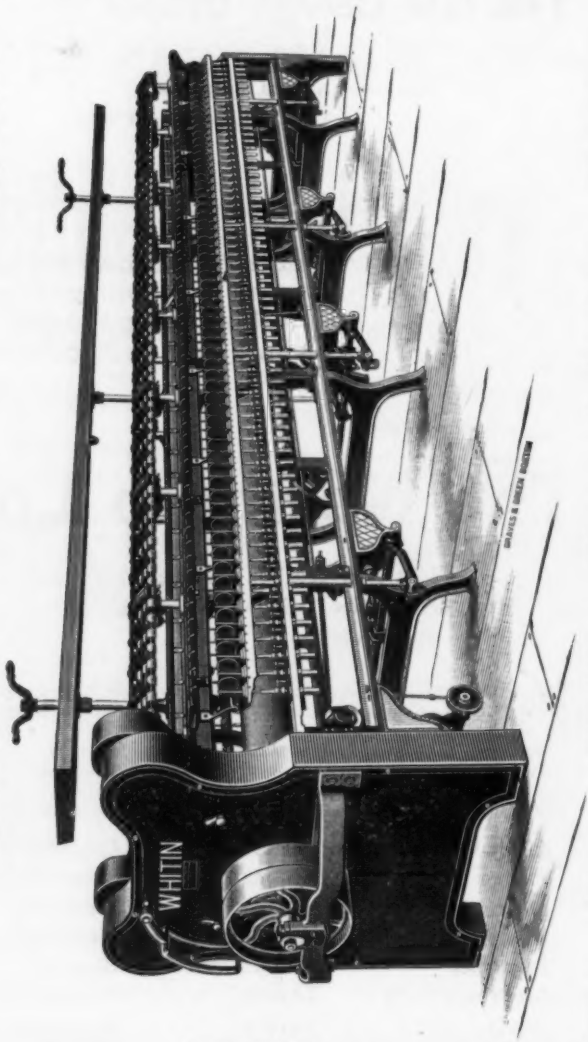

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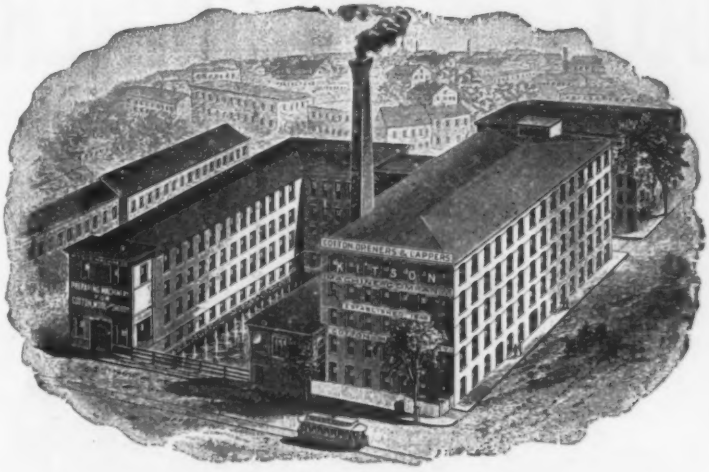

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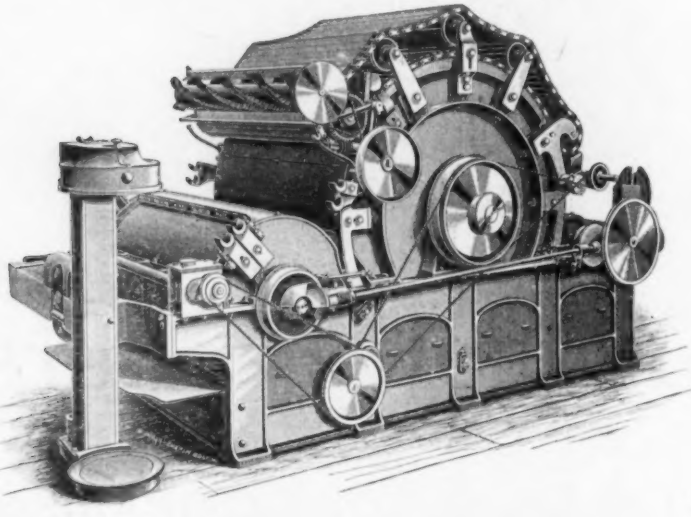

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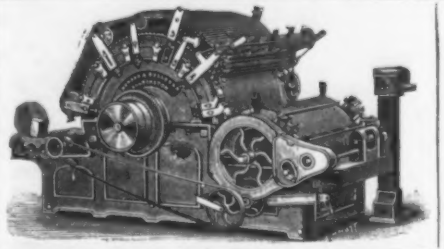

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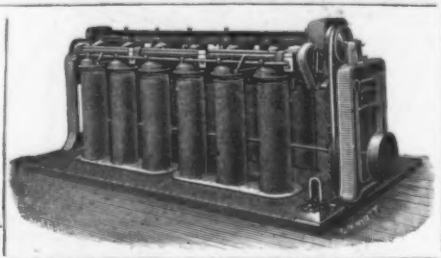

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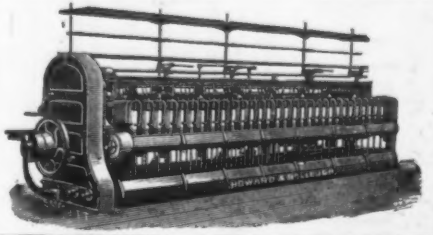

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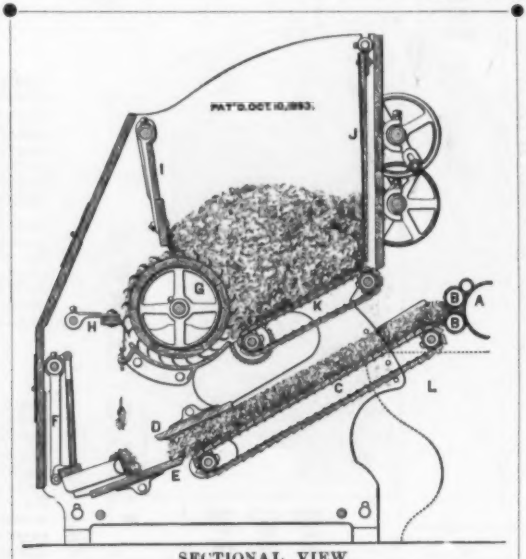

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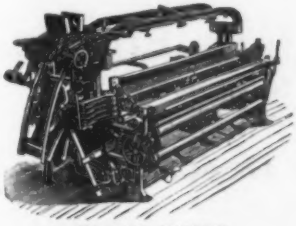

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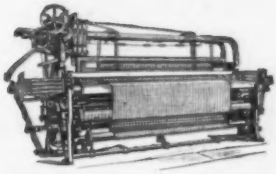

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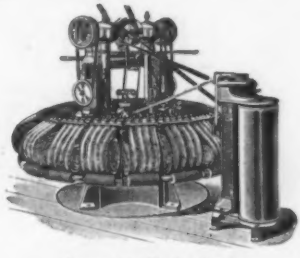
Wool



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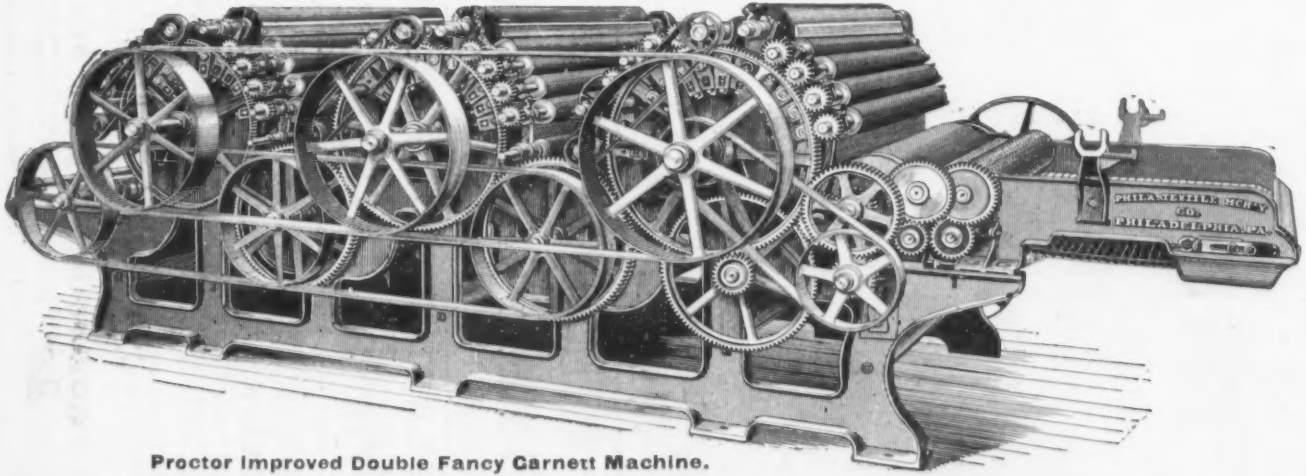

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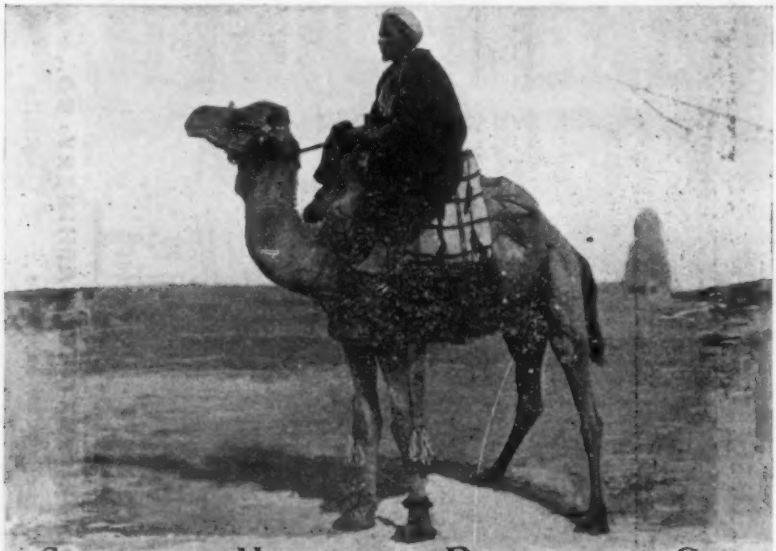

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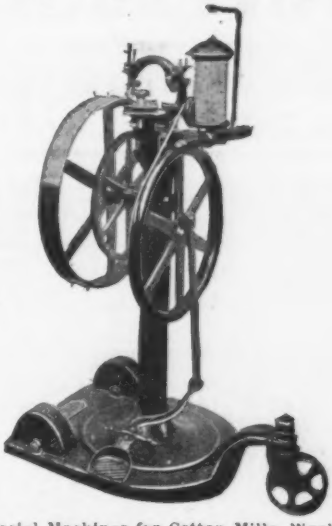

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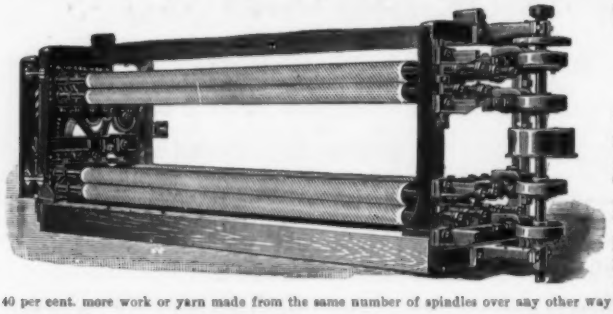

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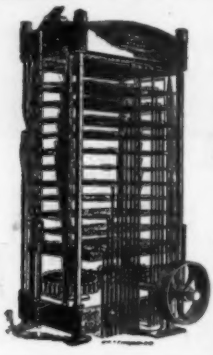

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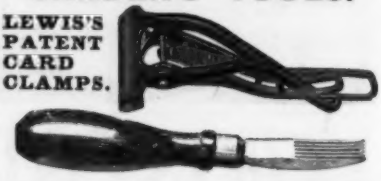

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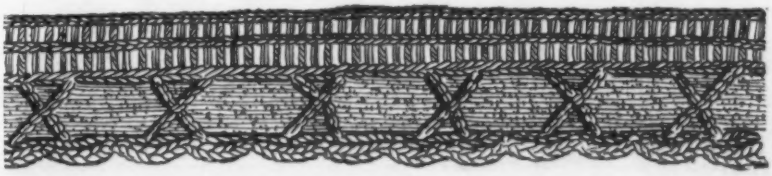

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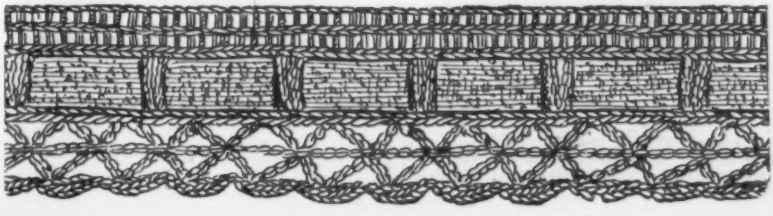

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Of all kinds, including the **French with Latest Improvements.**

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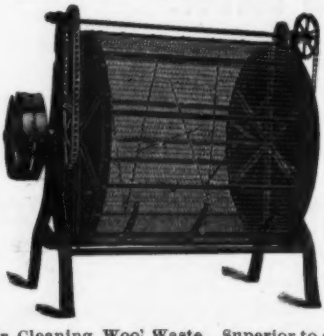

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Designers for all Textile Fabrics,

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Manufacturer of

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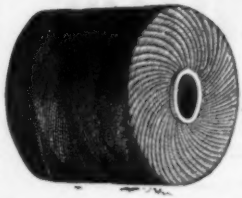

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PATENTS

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Telephone 3593, Boston. **Office Established 1854.** Cable address Aniline.

George W. Gregory, in November, 1874, resigned his position as Principal Examiner U. S. Patent Office to enter the firm.

Patents secured in the United States and all other countries. Reissues obtained. Interferences conducted. Suits brought and defended for infringement, and searches made as to the validity of patents. Prepared to give special and expert attention to cases involving knowledge of cotton, wool, leather and metal working machinery, including boots and shoes and electrical, chemical and metallurgical inventions and steam engineering Correspondence solicited. No charge for preliminary advice. Personal consultation best when possible.

HOPEDALE, Mass., January 2d, 1896.

Mr. George W. Gregory, of Crosby and Gregory, has taken out for us since January, 1875, more than two hundred patents.

GEO. DRAPER & SONS.

PATENTS

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Patent Causes, Patents, Copyrights, Trademarks.

Experts in all matters connected with the manufacture of Textile Fabrics, Sewing Machines, and Electricity

List of Textile Patents Issued May, 1897.

Specifications and drawings furnished for ten cents each. Address W. S. Gavey, P. O. Box 222, Brooklyn, N. Y.

Apparatus for Operating Belt Shifters for stopping knitting machines. 582,676. W. S. Ostrander, Amsterdam, N. Y.

Bobbin Winding Machine. 582,123. S. M. Green, Holyoke, Mass.

Card Clothing Attaching Device. 581,752. C. Mills and R. W. Hunter, Newton, Mass.

Card Clothing Preparing Device. 581,748. C. Mills, Newton, Mass.

Device for Attaching Card Clothing to flats. 581,749. C. Mills, Newton, Mass.

Dyeing. 583,298. V. G. Bloede, Baltimore, Maryland.

Friction Gearing for Driving Napping machines. 581,760. E. McCreary, Cohoes, New York.

Knitting Machine. 581,887. J. E. Rowe, Pawtucket, R. I.

Knitting Machine. 582,431. F. A. Nye, Philadelphia, Pa.

Knitting Machine. 583,435. H. E. Harbaugh, Kenosha, Wis.

Knitting Machine Take-up Mechanism. 582,452. J. C. Brewin, Phila., Pa.

Knitting Machine with Transplaceable thread guide. 583,129. J. Schmitt, Cologne, Germany.

Loom Box Motion. 583,425. H. Bardsley, Providence, R. I.

Loom Electric Warp Stop Motion. {583,213. {583,214. R. J. Mommers, Manchester, Ct.

Loom for Weaving Pile Fabrics. 582,398. A. Siret, Paris, France.

Loom Shedding Mechanism. 582,924. G. F. Hutchins, Worcester, Mass.

Loom Pattern Mechanism. {583,233. {583,234. J. M. Marco, Philadelphia, Pa.

Loom Warp Stop Motion. 582,904. W. F. Draper, Hopedale, Mass.

Loom Warp Stop Motion. 583,416. J. H. Northrop, Hopedale, Mass.

Loom Warp Stop Motion. 583,419. C. F. Roper, Hopedale, Mass.

Machine for Attaching Clips to Card clothing. 581,751. C. Mills, Newton, Mass.

Machine for Fastening Card Clothing to flats. 581,750. C. Mills, Newton, Mass.

Machine for Making Flat Fastening clips for card clothing. 581,753. C. Mills and L. W. Penney, Newton, Mass.

Machine for Winding Thread onto bobbins. 581,708. E. Franke, Wienersdorf, Austria, Hungary.

Napping Machine Gearing. 581,759. E. McCreary, Cohoes, N. Y.

Ring Spinning Frame. 582,268. A. D. Chandler, Lowell, Mass.

Rotary Yarn Dyeing Machine. 581,801. T. Wolstenholme, Philadelphia, Pa.

Shuttle Box. 582,981. J. A. Claus, Lowell, Mass.

Spinning and Twisting Frame. 581,745. H. D. Martin and J. P. Tolman, Newton, Mass.

Spindle for Roving, Slubbing or Similar machines 581,913. A. Kirschner, St. Etenne-de-Rouvray, France.

Spindle Support. 583,089. A. Scheid, Harrison, N. J.

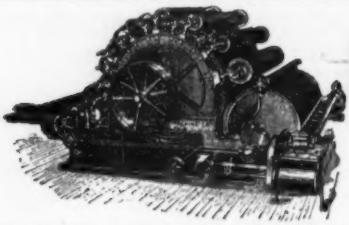
Straight Knitting Machine. 582,547. J. G. Powell, Philadelphia, Pa.

Straight or Flat Knitting Machine. 583,040. E. J. Franck and A. Getright, Philadelphia, and Defiance, N. J.

Warp Knitting Machine. 582,589. H. Maxfield, Jersey City, N. J.

Woolen Card Stop Motion. 582,991. P. H. Walsh, Saugus, Mass.

Yarn Drying Apparatus. 581,948. C. G. V. Sjostrom, Newton, Mass.



First Breaker Woolen Card No. 3.

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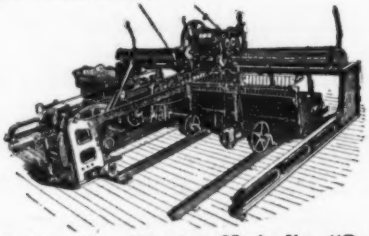

Self-Acting Woolen Mule No. 113.

Makers of

WOOLEN MACHINERY.

Write for Catalogue.

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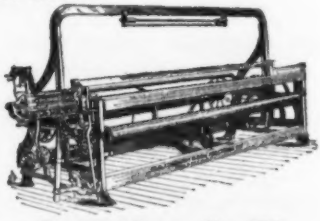

Blanket Loom No. 128.

The Phoenix Mills Company of Chester, Pa.

The plant of the Phoenix Mills Co., established two months ago for the manufacture of tops and worsted yarn, for the weaving and knitting trades, increases the importance of Chester, as a manufacturing point, and adds another to the growing list of finely equipped manufactories in the Middle States. Supplied throughout with new machinery, favorably located for fuel, help, climate and shipping, and accessible to the great industrial centre of Philadelphia, the new enterprise is inaugurated under highly favorable conditions. The staple production of tops of all grades, and yarns, for the weaving and knitting trades, constitute the mills' output, although a special feature of importance, not general with manufacturers, will be the production of yarn in low numbers, made from fine stock. The machinery outfit includes 13 sets of cards and 7 combs, 8 mules, one set of preparers, as well as all gilling and scouring machinery necessary. The offices are separate from the mill buildings, and are handsomely appointed. An electric plant has recently been put in, which will supply light for overtime work. The firm is composed of William Browne, Samuel C. Browne, Bernard S. Browne and William Anderson, Jr., of Philadelphia, Mr. Anderson being the active manager at the mills. An addition has been made to the buildings, which for years have been operated by Geo Campbell, of Philadelphia, under the well known name of the Phoenix Mills. Since the establishment of the business, we are informed that a steady run of orders has kept the mill in operation, and that during the ensuing month, night work will be found necessary.

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RICHMOND, VA.

GRAVEL, SLAG AND COMPOSITION ROOFERS.

MANUFACTURERS OF

Two and Three-ply Asphalt Ready Roofing for roofs of any description, water, acid and fire proof; more durable than metal; easily applied. Tarred Felts, Building, Sheathing and Insulating Papers, Roofing Pitch, Paving Pitch, Roof Paints and Roof Coating, Black Varnish, Ammonia, Etc. Write for Samples, Prices and Catalogues. **Quality and Workmanship Guaranteed.**

GEORGE SYKES.

TEXTILE WORLD.

Vol. XII. JUNE, 1897. No. 6.

GEORGE SYKES.

George Sykes was born in Honley, New Huddersfield, Yorkshire, England, April 4th, 1840. Huddersfield was then, and has continued to be to the present time, a principal centre, in England, of the woolen manufacture, especially in fancy coatings and trouserings of the best quality. Mr. Sykes' grandfathers, paternal and maternal, were skilled workmen, each of them in a department of the woolen manufacture, the former in the weaving, and the latter in the finishing department. His father, John Sykes, in his youth and early manhood, was trained to the woolen manufacture in all its branches, and worked at it near Huddersfield until his son George was about eleven years of age, when he came to this country and obtained employment at Millville, Mass., in the woolen mills of E. S. Hall & Co., a firm which then, and for many years afterwards, enjoyed the highest reputation as manufacturers of fancy cassimeres.

For several years before coming to this country, George Sykes had enjoyed the advantage of attendance at a national school; and coming with his parents to this country, he became a pupil in the district school in Millville, and for some time longer pursued his studies, securing a good English education. When about fourteen years of age he entered the mill of E. S. Hall & Co., as a boy in the carding room. With a natural aptitude for mechanical work and a diligent attention to his duties, he passed from one branch of the industry to another, becoming a weaver, then loom-fixer, and afterwards second hand in the weave room.

In 1863, Mr. Sykes removed to Cavendish, Vt., having been engaged to take charge of the weaving in the woolen mill in that town, then belonging to Fred Fullerton & Co. In less than a year he was appointed superintendent of the mill, which position he held for about three years.

In 1866, he was invited to take the charge, as manufacturing manager, of the Hockanum Mill, and accepting the appointment, he immediately removed to Rockville, Conn., where he has since resided. Under his management, the goods of this mill became well known in the market, and to-day the name of the Hockanum Co. stands prominent among the manufacturing establishments which have secured for Rockville its high reputation as an important centre of the fine woolen industries of New England.

In 1874, the Saxony Mill, at Rockville, was bought and filled with looms, and became part of the Hockanum Co. In 1879, George Maxwell and Mr. Sykes bought the New England Company's mill, reorganized it, and made it into a joint stock company. In 1886, the Springville Manufacturing Company's stock was bought by Mr. Maxwell and Mr. Sykes, and is now being operated under the old charter, the old mill being removed and a new modern mill erected on its site, being considered one of the best equipped and successful woolen mills of its kind in the country. Mr. Sykes is president of the

three mentioned corporations—Hockanum Co., New England Co., Springville Mfg. Co. All of these mills manufacture fancy cassimeres and worsted goods for men's wear.

The Hockanum Co. has a capital of $300,000, ten sets of cards and 162 broad looms. This company was organized in 1833, with two sets of woolen machinery for the manufacture of satinets, which was its product until 1858, when the manufacture of all-wool fancy cassimeres was commenced. Since then, the aim of the company has been to make high grade cassimeres, in both material and style. For this purpose, the finest native and imported wools have been selected. In 1873, the company sent a number of pieces of its goods to the Vienna Exposition to compete with foreign makes, and were awarded a medal for superiority of manufacture. At the Philadelphia Exposition, in 1876, an award was given to the company's exhibit for "a superb display of fancy cassimeres and worsted suitings, excellent in all respects." At the World's Columbian Exposition, in 1893, the products of the mills were greatly admired by foreign experts and others, and were given an award on fancy cassimeres "for beautiful fine and even spinning, excellent designs and beauty of finish;" and on worsteds, "for beautiful new designs, splendid colorings and excellent finish." Mr. Henry Latzko, the Imperial Commissioner of Austria to this exposition, a successful worsted manufacturer at Brunn, and one of the judges on textile exhibits, pronounced the goods of the company equal in every respect to the best made in Europe.

The New England Company has a capital of $240,000, nine sets of cards and 109 broad looms. It was organized in 1837 for the manufacture of satinets, but, in 1842, the product of the mill was changed over to fancy cassimeres, for which Crompton looms were put in. In 1879, the manufacture of worsted goods was commenced. The fabrics made by this mill rank among the best in the country.

The Springville Manufacturing Company is a recent organization, having a capital of $250,000, five sets of cards and 114 broad looms. The present mill was built in 1886. This company furnished the cloth for the suit of clothes worn by President Harrison on the occasion of his inauguration in March, 1889.

Mr. Sykes comes from a family of mill men. His father and his grandfathers on both sides, as well as his three brothers, were or are engaged in the woolen manufacturing business.

Mr. Sykes is a director in the Rockville National Bank, Rockville Savings Bank, Rockville Aqueduct Water Power Co. and the Rockville Railway.

—The fact that worsted tops have a higher duty placed upon them than yarns made therefrom, is apparently a just cause for criticism. It is not consistent that the product of a subsequent process in manufacture should bear a less protection than that which comes before. We allude to the provision where wool and hair, which have not been advanced in any manner, or by any process of manufacture beyond the washed or scoured condition, not especially provided for, shall be subject to the same duties as are imposed upon the fully manufactured article. It would be more consistent in the revision of the tariff if this phraseology were changed so as to make the duties on the unmanufactured product not greater than the duties imposed on yarns.

—Our recent intercourses with Southern cotton manufacturers who have been visiting this neighborhood, impress us with the growing sentiment in that section, favoring a strong protective policy on the part of the government. This is one of the strange vicissitudes of the times, where a protective sentiment presents itself in emphatic terms among a people that heretofore have been antagonistic to any policy of this kind.

Textile World

WITH WHICH IS INCORPORATED THE

INDUSTRIAL RECORD,

COMBINING

THE AMERICAN TEXTILE, THE DESIGNER AND WEAVER, WARP AND WEFT, THE WOOLEN MANUFACTURER

AND THE

BOSTON TEXTILE.

An Illustrated Monthly Magazine representing the Textile Industries of the United States.

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PUBLICATION AND HEAD OFFICES:

BOSTON: - 620 ATLANTIC AVE.

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Every paid up Subscriber will hereafter receive without extra charge

THE TEXTILE WORLD'S COMPLETE DIRECTORY OF THE TRADE.

(over 300 pages)

Containing full information about all

COTTON MILLS, WOOLEN MILLS,
KNITTING MILLS, SILK MILLS,
DYE WORKS, PRINT WORKS,
BLEACHERIES,

also lists of

Dry Goods Commission Merchants,
Dealers in Raw Materials,
Manufacturing Clothiers,
Suit and Cloak Makers,
Jobbers and Large Retailers,
Buyers from First Hands.

Special quarterly issues are published in January, April, July and October; one (January) being a statistical issue, and the others devoted especially to the cotton, knitting and woolen branches, respectively.

THE DIRECTORY.

The TEXTILE WORLD'S Directory of the Trade for 1897 has been published, and a good part of the edition has been delivered. We are receiving hundreds of letters from advertisers and subscribers, acknowledging receipt of the book, and speaking in warm terms of appreciation of the work.

We have tried to make it the best directory published in point of accuracy, completeness of contents and convenience of arrangement. The contents of the Directory are described on page 127.

OUR SOUTH AMERICAN VISITORS.

We have in our midst, a number of representatives from Latin America, as delegates from the principal commercial bodies and municipalities in that part of the Western Hemisphere. This is the most distinguished body of men from the republics south of us, since the day of the Pan-American Congress, which was held in Washington, at the solicitation of Secretary of State James G. Blaine. The delegates propose to visit all of the great industrial centres of this country, consuming, at least, six weeks of their time. This visit is in the nature of a return of the visit of a body of American citizens, representing the National Association of Manufacturers, to South America, last summer, to investigate the trade conditions in that section.

At the time this magazine is going to press, the delegates are receiving the hospitalities of Fall River and Boston. In the former city, the citizens are making the occasion a holiday affair and an object one for the exhibition of the textile products of this enterprising manufacturing locality. Two days are being spent in Boston and the immediate neighborhood. Little, or no, time has been planned for visiting the textile mills of Lowell and Lawrence. Important results are anticipated from this visit. At least, nothing will be left undone to make it so.

The visit to South America of the commission representing the National Association of Manufacturers resulted in gathering much information, showing that there is opportunity for a large increase in the volume of our South American trade. In order that this increase shall be realized, it is evident that our merchants and manufacturers will have to devote careful study to the requirements of South American markets, and to become familiar with the classes of goods that are salable there, and the manner and methods according to which trade is conducted. The first essential to this end is through personal contact with representative merchants and citizens of that section. The necessity of cultivating a trade such as this is more fully realized at the present time than ever before, as our domestic markets are becoming well supplied with our own manufactures. More attention will have to be given on our part, aided by proper legislation, to the proper building up of transportation and banking facilities, having a direct business connection with the foreign countries whose trade we desire to cultivate. We need, for the proper development of this trade, a restoration of our merchant marine, which is at the present time in a most pitiable condition. Our coastwise, lake and river commerce is well taken care of by American vessels, but we lack in this respect proper shipping facilities for a foreign trade. As an exhibition of this, it is only necessary for us to cite that less than 12 per cent. of our foreign trade is carried in American vessels, showing a remarkably low status compared with that existing fifty years ago, when 81 per cent. of our foreign trade was carried in American ships. Since then, there has been a gradual decline, as in 1855 the percentage was only 75.6; in 1860, 66.5; in 1870, 35.6; in 1880, 17.4; in 1890, 12.9; and now as above stated.

The total imports into the United States for 1894-95 amounted to $731,969,965, and the total exports for the same period, to $807,538,165, only 15.1 per cent. of which imports came from South American countries, and 4.1 per cent. of the exports sent thereto. The principal country with which we have trade relations in South America is Brazil, amounting to somewhat less than $100,000,000. Most of the imports from South American countries consist of articles that enter our ports free of duty, such as coffee, hides and skins, wool, india rubber and nitrate of soda. Our exports consist chiefly of agricultural implements, breadstuffs and provisions, cotton goods, illuminating oils and manufactures of wood.

OUR TEXTILE SCHOOLS.

The vacation period of the Philadelphia and Lowell Textile Schools has commenced, the former closing with graduating exercises, while the latter simply brought the first term of its first year's course to an end. The Lowell school will not have a graduating class until the end of the third year's course. The progress thus far made by the students of this school has been highly satisfactory, especially in its cotton department. The two examinations—one at mid-term and the other just before the close—were gratifying, considering the limited tuition and practical experience, in the mill, of those receiving instruction. The examinations of the evening class were especially gratifying, considering the opportunities of the students who worked during the day in mills, and, therefore, were unable to receive the advantages of the day exercises. The attendance at the evening class averaged over one hundred students, the number being in the neighborhood of 123 at the close. The school will be opened next fall with additional equipment in its dyeing and chemistry department, art department, mechanical drawing, woolen and worsted, carding, and combing and spinning departments. There is a class for

women in the designing department, with a promising membership. Here is an excellent opportunity for young women to gain instruction in a pleasant and lucrative vocation.

The Philadelphia School sustained its high standard during the past year, and the students that it has yearly graduated have been a credit to the institution and the instruction received therein. Many improvements were made during the past year, and further improvements, with new apparatus, are planned for the coming year. The school now provides for an excellent course of lectures. Medals were awarded at the commencement exercises to a number of students, for general excellence, for best results in Jacquard designing and weaving, for best results in color harmony and designing, for accuracy and neatness in work, in connection with regularity of attendance, and for the best work in dyeing. Certain second prizes were given for some of the foregoing purposes. The donors of the medals that were awarded were: The National Association of Wool Manufacturers (gold, silver and bronze), and the TEXTILE WORLD (gold, silver and bronze).

WOOL IMPORTS.

We give, herewith, the statistics of the wool imports for the last five months, from January to May inclusive. The May statistics were sent to us through the courtesy of the several collectors of customs at Philadelphia, New York and Boston, previous to their transmission to Washington for publication. They will be entertaining reading, showing that for these months there has been imported wool to the amount of 246,484,801 pounds, of which 160,660,346 pounds were of class one, or merino; 18,579,840 pounds, class two; and 67,244,615 pounds, class three. We have in these imports a year's supply of foreign wool. The imports for April, it will be noted, were enormous. For comparative purposes, we give the following statistics of the imports of wool for the twelve months ending December 1895 and 1896:

	1895.	*1896.*
Class 1	126,435,569	75,370,527
" 2	18,757,042	9,979,959
" 3	103,796,606	74,325,529
Total	248,989,217	159,776,015

Compared with the imports for 1895, it will be seen that we have imported for the last five months, more than enough for a year's supply of class one wool, a year's supply of class two, and nine months' supply of class three wool.

WOOL IMPORTS.

	January Pounds.	February Pounds.	March Pounds	April Pounds.	May Pounds.
Class One:					
Boston . . .	4,323,049	11,838,017	23,715,532	50,978,476	21,334,467
New York . .	4,020,903	4,102,408	12,765,340	15,971,603	4,424,901
Philadelphia .	463,188	582,258	1,403,558	4,633,186	1,413,528
Total	8,807,092	15,922,683	37,874,435	70,883,265	27,172,881
Class Two:					
Boston . . .	462,665	1,556,474	8,381,528	4,594,990	4,189,617
New York . .	25,620	18,251	607,149	2,188,327	211,986
Philadelphia .	22,454	30,709	398,550	648,844	152,701
Total	510,739	1,775,434	4,397,202	7,342,161	4,534,304
Class Three:					
Boston . . .	1,442,746	2,388,117	2,673,880	6,341,742	6,257,828
New York . .	7,087,980	9,099,488	9,178,465	9,612,394	4,594,715
Philadelphia .	1,894,480	761,178	552,450	3,390,732	1,389,095
Total	10,945,156	12,248,778	12,405,205	19,403,868	12,241,608
Grand Total	20,262,987	29,946,895	54,676,832	97,629,294	43,948,793

The present condition of the London wool market is strong, with advancing tendencies. The last series of the Colonial wool sales ended with great animation, at an advance on the open-

ing prices, with an upward tendency which has continued. The price of wool, however, to-day, does not show that advance over January prices, as many are inclined to think (15 to 20 per cent). At the beginning of the year, manufacturers were able to buy Australian wool on the basis of 38 to 40 cents clean for 60s to 64s, while the same wool now commands 43 to 44 cents clean, an advance of 10 to 12 per cent. The English and Continental mills, are short of a supply, due largely to the fact that they did not enter into competition with American buyers, at the last sales, prefering to wait till the demand has reached more nominal conditions, in the hopes of obtaining their wants at a reduced price. They, however, now realize their mistake, and find that the choice selections have been secured for American account. The best Australian clips are now in our markets.

TARIFF ON COTTON.

The recent action of the Senate, by so decisive a vote as 42 to 19, amending the tariff bill by placing raw cotton upon the dutiable list, has been a great surprise—a thing that was only remotely thought of or expected. We doubt very much if the action will stand in the conference between the two Houses. The fact, however, that it met with such ready favor, apparently, at the time of its proposition, excites apprehension of the final result. In some respects, as a raw material, cotton might be classed with wool as properly dutiable; still, the status of the two articles are entirely different, one being an export commodity and the other far from it. The domestic growth of cotton cannot be affected by any tariff that may be placed upon the imported article, while with wool it is entirely different. It appears that the duty on cotton was proposed by one of the Senators from Georgia, in which he was supported by his colleague, the two Senators from South Corolina, one from Louisiana and one from Utah, besides the Republican Senators. The Senators from South Carolina and Georgia, certainly, could bring forward no argument to show that their constituents would be benefited by a duty on cotton, as such a proposition could not be sustained, except on the ground of encouraging the growth of the long stapled fibre, which, in truth, would not be affected by it. It has been demonstrated by many experiments that this cotton cannot be grown, profitably, in either of these States, except along the coasts. Any attempts in this direction would be a waste of money and effort. In Louisiana and the bottomlands of the Mississippi, there is a possibility of growing long stapled cotton, but, even there, it is questionable whether such a crop would be as profitable as one of the shorter stapled varieties. Then again, the Egyptian cotton has characteristics that are not possessed by any American growths, and a duty placed upon it would be detrimental to the manufacturing industry alone, and to that extent prevent the diversity of manufacture that is now so essential to encourage.

The imports of cotton for the calendar years 1895 and 1896 were, respectively, 49,692,431 pounds and 47,318,524 pounds. The average import price for 1896 was 11.9 cents per pound. Were the imports 50,000,000 pounds a year, it would be a mere bagatelle, or four per cent. of the amount of cotton consumed in this country.

ARTIFICIAL SILK.

We refer elsewhere to the movement for the establishment of a new industry in this country for the fabrication of artificial silk. There is a large amount of energy and capital back of the movement, which will result, undoubtedly, in the erection of a manufacturing plant, with consequences that cannot at the present time be foretold; yet, if the statements that come to us of the good results in this line in foreign countries

are to receive credence, there seems to be no unsurmountable obstacles for the success of an enterprise of this kind in this country.

That elegant specimens in imitation of silk can be produced from the artificial fibre has been most thoroughly demonstrated. The imitation is so close that with the unaided eye detection between the artificial and the real is impossible. The magnifying glass shows a better constructed fabric made from the artificial than from the natural fibre. The thread is smoother, and the lay of the yarn is more uniform. In this respect it is superior. We find here an illustration of the competition of art and the ingenuity of man against nature. The artificial and real silk are both the result of the digestion of ligneous matter, the one effected by machinery invented by man, and the other by the organs of a caterpillar.

—Prospects for the passage of a tariff bill by Congress, and its approval by the president, are favorable for its becoming a law before the first of July, or the 15th of the month at the latest. The progress made has been much more rapid than was feared three or four weeks ago. The views of wool growers will be met more fully by recent amendments to the Senate recommendations than first reported. The bill favors agricultural more than manufacturing interests. On the whole, the woolen schedule is satisfactory to manufacturers, in the amount of real protection that they receive.

—With some exceptions, of course, the cotton mills of the South lack necessary capital to operate their plants in the most economical manner. Many of our Southern exchanges seem to ignore this fact, though if viewed in its proper light, is no discredit, but just the reverse, when we consider the many instances of Southern cotton mills making a profit, notwithstanding the difficulties under which they are laboring for want of money, for operating expenses. We note this, because parties from the South, engaged in manufacturing are making their presence known in Boston, and its vicinity, for the purpose of obtaining the necessary amount of capital, either at a low rate of interest, or by the sale of shares.

—W. & J. Sloane are offering a large lot of Axminster carpets at 95 cents per yard. The name of Axminster has degenerated, and no longer represents the best character of carpet that is made.

The Linen Industry.

More attention has been given to the framing of the linen schedule in the tariff bill than at any previous time in the revision of the customs law. The competition and depression that now exists in the cotton manufacturing industry is so great that many New England manufacturers are considering quite seriously the advisability of turning much of their machinery or capital to the manufacture of linen fabrics. There is a feeling that something will have to be done in order to diversify the character of textile manufactures allied to cotton, and there are only two ways to do it, either for the mills to diversify their product in the way of cotton goods, or by turning their machinery to the use of flax. This has been done in a number of conspicuous instances. The Boott Cotton Mills, of Lowell, may be cited. These mills have already put a number of cotton looms on to the weaving of linen fabrics, the yarn being obtained from abroad, because that of necessary fineness cannot be obtained of domestic manufacture, though there are linen thread mills that are willing to make fine counts, provided there is a sufficient demand for them. We have seen some of the goods manufactured by these mills, and, certainly, they are very creditable, consist-

ing of cotton warp and linen filling, woven into dress goods, plain, open and leno weaves.

The establishment of the linen industry should be encouraged by tariff legislation. That apparently admits of no dispute, if there is any reason to be assigned for the promotion of any of our textile industries. Whether the rates of duty are too high, as claimed by the importers, or not, is something that experience only can decide. The tariff on linen fabrics, as reported by the Ways and Means Committee, is generally satisfactory to those who have entered upon the manufacture of these products. Some modifications have been made in the Senate revision. The assertion of importers that the rates of duty under the Senate bill are higher than those of the House bill, and range from 50 to 109 per cent., is not strictly correct, based upon the list of fabrics that have been imported into this country of late years, which show that the maximum rate, according to the Senate revision, is under 70 per cent., and the average about 55 per cent.; but, as will be noted in the table which we give below, manufactures not otherwise provided for are subject to a 45 per cent. rate by the Senate bill, against 50 per cent. by the House bill.

There is no reason why the manufacture of linens should not be profitable in this country. The mere fact that attempts have not been made heretofore is no argument against future success. The necessity of this industry, in order to diversify our textile industries, has never been so apparent as it is to-day. All that manufacturers, at the present time, ask Congress, is to give them an opportunity to compete with foreign manufactures; and, in order to do this, they ask for only 15 to 20 per cent. discrimination in favor of their goods. This means this amount of protection above the duty that has to be paid upon yarn.

We believe in giving the manufacturer of yarns and threads sufficient protection to encourage him in his industry, but it is much more important that the weaver should receive ample protection, in order to create a demand for the yarn; and, reasoning backwards, it is more important that the thread manufacturer should receive protection than the one that produces the fibre or hackles it. It is impossible to promote the growth and hackling of flax fibre unless the home demand from manufacturers is encouraged. A manufacturing industry should be established and placed upon a profitable basis first. After this, the time will be ripe for a tariff to promote the flax growing industry. From the enactment of the first tariff act, in 1789, until the act of 1870 (1828-1830 excepted), flax in its raw state or hackled, was classified the same as raw flax, and admitted at our ports at the same rate of duty. From 1870 to 1894, a slight difference was made in the rates between scutched and hackled flax, and the law of 1894 still retained a duty on the latter, but placed the former on the free list. We again desire to note that to the manufacturer, in the present stage of the industry, it is highly essential that he should have the markets of the world open to him for the selection of his raw material, in order that he may not be limited in the character of his products to the peculiarities of the domestic article. The flax product of every country has its special qualities and peculiarities.

The growth of flax in this country has been almost wholly for the seed, the value of the product amounting to about $15,000,000 per annum—many times greater than the value of all the flax fibre imported. In 1869, according to the census reports, the fibre production in the United States was 27,133,034 pounds; in 1879, 1,565,546 pounds; and in 1889, 241,389 pounds; thus showing that the production of fibre has gradually grown less from decade to decade, as being far less profitable than that obtained in the

growth of seed. The relative production of flax seed and fibre, according to the census returns, was for

1849	1371	lbs.	fibre	to	every	100	bu.	of seed.
1859	833	"	"	"	"	"	"	"
1869	1568	"	"	"	"	"	"	"
1879	100	"	"	"	458	"	"	"
1889	100	"	"	"	4246	"	"	"

In 1889, the combined production of fibre in twenty-one States amounted to only six car-loads.

In the following table we give the rates as reported in the House and Senate bills. It does not cover the schedule perfectly, but is given in its essential features:

	House.	*Senate.*
Not hackled or dressed, per lb.	1 ct.	¾ ct.
Hackled (dressed line) per lb.	3 "	2½ "
Threads, from yarn under 5 lea, per lb.	12 "	12 "
Threads from yarn over 5 lea, additional for each lea, per lb.	⅛ "	¼ "
Single yarn at 13 cts. or less, per lb.	6 "	
Single yarn at over 13 cts., per cent.	45	
Single yarn 8 lea or less, per lb.		6 "
Single yarn 8 to 80 lea, per cent.		40
Single yarn over 80 lea, per cent.		15
Fabrics, less than 50 threads to the sq. in., per lb.	8 "	
Fabrics, 50 to 100 threads, per lb.	9 "	
Manufactures not otherwise provided for, per cent.	50	45
Fabrics weighing 4 oz. or more per sq. yd., containing not more than 60 threads per sq. in.		1¾ cts. and 30%
Over 60 threads and under 120 threads		3 cts. and 30%
Over 120 threads and under 180 threads		7 cts. and 30%
Over 180 threads		10 cts. and 30%
Fine shirting linens weighing under 4 oz. per sq. yds., containing over 100 threads per sq. in.		35%

CURTAILMENT OF PRODUCTION.

We speak, elsewhere, of the proposed curtailment or lessening of production among the cotton yarn spinners in the Southern States. This has special reference to those mills that are running on No. 20 and less. Although there were present at the convention but few spinners outside of those representing the mills of North Carolina, there seems to be no question but that the necessary two-thirds of the spindles in the South will conform to the suggestions made, reducing the production of yarn from 8s to 20s 25 per cent., commencing June 15; that is, that the mills will stop at their convenience 30 days during the succeeding four months. The outcome of the convention was the formation of the Cotton Spinners' Association.

The depression in the cotton manufacturing industry is felt, apparently, as keenly in the South as in the North, where there is an agitation for a general curtailment of production, which we expect to see go into effect before long. The domestic trade for cotton goods seems to be anything but satisfactory, and the foreign trade is much broken up. There will be no effort made among the Northern mills, at least, for the curtailment of production at any specified time, but each mill will be at liberty to act according to its own convenience; but the percentage of curtailment will be agreed upon so as to affect all mills alike, if the scheme is carried through.

The condition of cotton manufacture is statistically exhibited in the last quarter's showing of the Fall River corporations, which declared dividends on an aggregate capital of $22,133,000 of only 87 per cent., and much of this was taken from past earnings. This is one of the most unsatisfactory exhibitions in the history of Fall River cotton manufacturing.

COAL TAR DYES.

The coal tar color paragraph in the tariff is receiving the earnest attention of those dealing in this commodity. There is no apparently good reason for discriminating between fast black coal tar dyes, and those of other colors. It does not seem consistent to favor one class to the prejudice of others. All should be placed on the dutiable list, or all should be made free; they should be treated alike, and no favoritism shown. But their proper place is among dutiable articles, and there they

should be classified. If the phrase is used, as it now appears in the Senate's revision of the tariff, of allowing fast blacks from coal tar to be on the free list, there will follow the utmost confusion in the classification of such importations, with the result that no importation of black dyes will come in dutiable. The retention of alizarine on the free list is an antiquated notion. This dye was placed there at first because it was not produced at all in this country; that is, the natural alizarine, ground from the madder root. During thirteen years of litigation over artificial alizarine, the patent was broken down, on the ground, among other things, that this product was not new, and then in the logical (?) minds of people, artificial alizarine obtained the same standing that the natural article already possessed. As no one, however, so far as we know, has asked Congress to put alizarine on the dutiable list, of course Congress has no incentive or excuse to put it there. It is generally understood that no one in this country cares to undertake its manufacture.

THE WOOL GROWERS' ADVANTAGE.

It seems that the wool growers do not realize the advantages they are receiving by the duty upon their product given to them by the tariff bill, as amended by the Senate Committee on Finance. Eight cents per pound duty on merino wool, is, on an advalorem basis, very much greater than the protection provided to the wool grower at the time of the passage of the Acts of 1867, 1883 or 1890. This fact was clearly brought out by Senator Aldrich, at the time that he made his opening argument in favor of the bill, as reported by the Finance Committee, in which he called attention to the fact, that in dealing with the wool schedule the committee suggested more liberal rates to the domestic wool grower than it recommended for the producer of any manufactured article in the schedule. It also suggested for him a more effective protection than he has ever received under any tariff law of the United States, at the time of its enactment. The wool grower is given the benefit of a specific duty upon all classes of wool. Under the operation of this fixed specific duty the amount of protection afforded will increase with each new decline in the foreign value of this raw material. By the Senate bill, the wool grower is better off by ten to twenty per cent. than in any previous tariff that gave him a duty on his product.

CONDITION OF BUSINESS.

Notwithstanding the more or less universal complaint of a continued depression in trade, there is apparently a lack of realization of the fact that there is a larger amount of merchandise being sold at this time then at a corresponding period in most any previous year, not excepting average years of prosperity. This is due to the low values and the small margins left for profit. If the condition of business was reckoned upon the quantity, instead of on the value of merchandise, a different complexion would be placed upon the situation. The increase in population has something to do with this material expansion of trade, still, even in this aspect of the situation, the comparison is more or less encouraging. The returns published by such excellent authorities as Dun's Review and Bradstreet's, show that there is a sure and gradual recovery in trade, and that May, for instance, compared with what was done in April, shows an increasing volume of business, and only ten per cent. smaller than that of the best year. The fact is scarcely realized that there has been exported from this country an extraordinary quantity of wheat and flour, which in time will have its effect upon business in general.

Native Help in Southern Mills.

Editor Textile World:

Will you kindly allow me to object to a portion of your able article on the subject of "Cotton Mills in Texas," in your last issue? You say: "We do not feel like advising anyone to undertake cotton manufacturing anywhere in the South, outside of the so-called Piedmont district, extending from Virginia to Alabama, yet some of the localities in this district have as many mills as they can conveniently operate, so far as obtaining a desirable class of native help is concerned."

I think you have been misled in this matter by the assertions of parties, who, for some reason or other, are opposed to the erection of new mills in the Piedmont district. I can assure you that those statements are incorrect. I have interviewed scores of mill men in Spartanburg and Mecklenburg Counties, during the past three or four months, and I have never met one that complained of scarcity of help. On the contrary, when a new mill is built in North or South Carolina, long before the machinery is in place, the superintendent has a list of applicants three times larger than the number of operatives he can possibly employ. All mill men agree that there is an abundance of help anywhere in the Piedmont district, including Eastern Alabama and Western Georgia, which many prominent Northern mill men whom I have accompanied down there think is the country for cotton manufacturing.

A. L. LANGELLIER,
Agt. L. & I. Dept., So. Rwy.
Boston, May 28, '97.

[We are always glad to receive criticism of anything that appears in this magazine. We did not intend to give the impression that there was no more room in the Piedmont district of the South to permit of the building and successful operation of cotton mills; in fact, as noted in the quotation from our remarks, we favored the Piedmont section, as being distinctly the cotton manufacturing section of the South. When we said that there are localities in that district having as many mills as they can conveniently operate with native help, we meant such as could be obtained in the immediate neighborhood; and by native, of course, we meant the whites, and not the negroes. At the present time there is an abundance of white natives in the South, in the aggregate, to supply the wants of cotton mills for a number of years to come; but with an increase in the demand, wages may have to be advanced to serve as an inducement for them to accept factory employment. Our statement in our May article was deliberately made and can be easily substantiated. —Editor.]

Textile Fibres.

[Lecture of Henry G. Kittredge before the Lowell Textile School, Lowell, Mass., February 24, 1897.]

(Concluded from May.)

Bast fibres are vegetable cells found cohering together in bundles, forming compound structures. The number of flax fibres, or units, in a bundle averages from 5 to 10, and are easily separated; of jute, from 6 to 20, firmly coherent; and of ramie from 3 to 5, sometimes only 1. A bundle of fibres diagrammatically shown is to be seen in plate *11*. This is one of the illustrations used by Prof D. Morris, assistant director of the Royal Garden, Kew., in one of his recent lectures. *A* is a longitudinal aspect showing the arrangement of the cells; *B* is a transverse section exhibiting the relative position of the individual cells, the thickness of the cell wall, and the cavity; *C* is an isolated fibre cell, much enlarged; *D* is a section of a cell showing the polygonal form due to compression; and *E* is the normal form of a cell, as it appears when examined under the microscope. An important matter to be considered in studying the commercial value of these fibres is the ease of their isolation, the disintegration of the fibre bundle and its separation from contiguous tissues. This is accomplished by some process, as with flax, for instance, as retting, or exposure to moisture or to the weather, followed by a mechanical treatment. It should be borne in

mind, however, that the ultimate fibre cell, except that of cotton, is not the spinning unit. The spinning unit is a bundle of ultimate cells, but the value of the spinning unit to the manufacturer depends largely upon the number and length of the ultimate cells contained therein. The least complex the fibre bundle and the longer the individual cells, greater is the value of the fibre to the manufacturer. We have in these factors, fineness and strength of fibre, and consequently the value of the manufactured product. Recurring to ramie, flax and jute fibres, I stated that ramie had 3 to 5 ultimate fibres in a

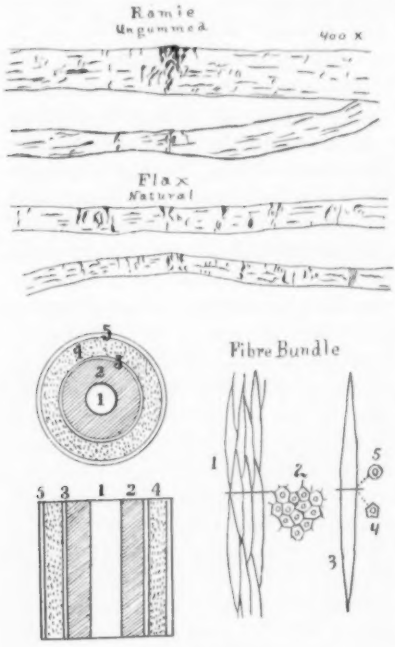


PLATE II.

bundle, each 1 1-2 to 8 inches in length; flax, 5 to 10 ultimate fibres in a bundle, each 1 1-2 inches in length; and jute, 6 to 20 ultimate fibres in a bundle, each less than an eighth of an inch in length. The relative value of these fibres is thus at once seen. The ramie fibre is the most valuable, in that it is less complex, contains a less number of ultimate units, therefore finer, and the latter longer, giving strength. These properties of ramie (fineness and strength) are not unknown to manufacturers, but very few know why these exist in this fibre and not to the same extent in flax, etc. The reason why, is seen in the foregoing; and it is because of these properties that ramie was preferred to flax, or any other fibre, in the manufacture of the sails of the racing yacht Defender. It is often stated upon experience that ramie fabrics will not mildew and rot as quickly as those made from flax, etc. As to the mildew part, I have no credence in, but the reason why they will not rot so quickly, is because the ultimate fibre is longer. Rotting is a process of disintegration of a fibre into its ultimate parts, and the longer and more overlapping the latter, the more protracted will be the time of complete decay. This is the reason why jute, with its very short fibre, decomposes so soon. Bleaching is a kind of rotting process, and unless great care is exercised the fabric is injured, and under no condition is it improved in strength. For the reason just stated, jute fabrics may come out of a bleaching process very tender, while a cotton, ramie or flax fabric will not be appreciably affected. It therefore becomes of the first importance for manufacturers to comprehend the physical structure of the fibres they work with, in order that they may understand how to handle them and appreciate the changes that they may undergo when subjected to mechanical or chemical processes. Without a comprehensive knowledge of these small but important things many mistakes will be made that might otherwise be avoided, or blind and expensive experience resorted to for their correction. Let me state, right here, in order to correct the notion of some, that there is no difference between ramie, rhea and China grass. These are names of the same and not of different substances. There should be no confusion in this particular. The great value of the ramie fibre has

long been recognized, but the difficulties attending its decortication in commercial quantities, have prevented its employment in our manufactures to any great extent. Methods for degumming it or the separation of its fibres have been sufficiently perfected to satisfy all requirements on that score. On the other hand, inventions after inventions have been patented for decorticating ramie, but none, so far as I can find out, is an assured success, notwithstanding the statements of the patentee and others who witness the trial of the machine under the most favorable conditions. There may be a machine in existence that is a success, but if there is one, it has not yet established for itself, in the estimation of the manufacturing community, the right to be so denominated. The difficulties attending the greater use of ramie is in this fact of there being no practicable method for the separation of the bast from the stem and rind in the dry state. The ordinary methods resorted to in the retting processes for flax, etc., are not suitable for ramie as the bast, after a comparatively short time, becomes so far separated into its ultimate fibres that the latter cannot be coherently recovered, but "become so entangled with the other portions of the stem that their subsequent separation is practically impossible." It is for this reason why better results are obtained in the decortication of green ramie stalks than dry ones. But it is not always feasible to obtain the former; hence, the necessity of devising some method whereby the latter can be utilized. After standing for some time, the fibre becomes so firmly attached to the woody portion of the stem that it cannot be completely detached, and, as this is almost inevitable in hot climates, like India, various remedies have been recommended to counteract this evil. According to Favier, the fibre may be readily separated from the dried stems by steaming them for 15 to 20 minutes in wooden boxes. Sansone recommends the treatment of the dried stems for 20 to 30 minutes in a boiling solution of carbonate of soda or of caustic soda, or the storing the green stems in pits containing a solution of bisulphite of soda or sulphurous acid by which fermentation is prevented" (Knecht, Rawson and Loewenthal). For basic coloring matter, it is said on the best of authority, ramie exhibits a slight affinity, and although easy to bleach, it is difficult to dye in full bright shades without injuring the characteristic lustre of the fibre." As to the ramie fibre itself, it is simply beautiful, and great effort is being made to bring its cost down to a figure which will permit of its use in competition with others of its class. Special machinery has to be employed for its manufacture, different from that for silk, though resembling it more than that used for other fibres. Experience has testified to this fact, but the reason is discoverable in the structure of the fibre itself. What is being done with ramie is still tentative, but it is evident that its value as a textile fibre is too great to suggest the possibility of the neglect of every means to bring its economical use in our manufactures to the front.

The silk fibre is the most perfect of all fibres. It is given to the manufacturer in a manufactured form, already spun. Of no other fibre can this be said. We have on plate *5*, a picture of the silk fibre. Its simplicity takes away from it everything that is unique. It is a nearly faultless fibre, fine and continuous, measuring from 1000 to 4000 feet long, without a joint or a blemish, though not of the same diameter or fineness through its entire length, as it becomes finer as the interior of the cocoon is approached. The silk fibre is really a double fibre, as will we seen—a fibre with a longitudinal dividing line. These two parts are very rarely seen separated in nature. The fibre is composed principally of two substances a gum or glue (sericin), which constitutes the exterior, and a white amorphous

compound called fibroin, which constitutes the interior and is known as the true fibre. The gum forms 20 to 25 per cent. of the raw silk, and is soluble in boiling water, while the fibroin forms about 70 per cent. of the silk and is not soluble in water. There are some impurities that should be considered. Fibroin is soluble in strong acids. There is much in common, however, between the two substances, the gum containing more oxygen and hydrogen, and less carbon and nitrogen than fibroin. It is supposed by some chemists that the gum, or sericin, is a modified form of fibroin, as it has been observed that the latter, upon exposure to the air, becomes coated with a gum soluble in water. These component parts of the silk fibre and their nature, should be fully known to manufacturers. It is essential that nothing be done that will disturb the gum more than is absolutely necessary if the full strength of the fibre is to be preserved, as there is danger of occurring in the process of manufacture. How important a factor the gum is, will be appreciated when it is stated that raw silk loses 30 per cent. of its strength and 45 per cent. of its elasticity when "discharged" of its gum. Still it has been found necessary to discharge or remove the silk gum in the course of manufacture, which is usually done by soapy solutions as being the least deleterious. The valuable characteristics of silk are not brought out till the gum is removed. With the removal of the gum silk is left soft and glossy, and the double fibre, so to speak, is separated into two single fibres. The silk I have alluded to is the product of the mulberry silkworm (Bombyx Mori), and is the kind generally cultivated and referred to as silk. Other kinds are known as wild silk, of little importance, except such as those from the Tussah and Muga silkworms. The former is more utilized in our manufacturers. The Tussah silk fibre is longer than that of the ordinary silk, ranging in length from 1800 to 6000 feet. The double fibre, or bave as it is called in France, has a large number of fibrils, in which respect it differs from the ordinary silk. These fibrils are of exquisite fineness, and their number shows that the secreting organs of caterpillar are more complicated than those of the Bombyx variety. The color of the former, too, is in the fibroin as well as in the sericin portion of the fibre, while the color of the latter is wholly in the sericin or gummy portion. The difficulty of bleaching Tussah silk is, therefore, much greater than that attending the bleaching of common silk, and its affinity for dyes is not so great.

From what little I have said about the few most important fibres used in the manufacture of textile fabrics I think it will be seen that however simple they may appear to the casual observer, to the student and to the man of science, as all those engaged in manufacturing should be, they present phases of more or less complexity, involving peculiarities, upon the proper knowledge and appreciation of which depends the successful prosecution of the art of manufacture. They are fundamental and primary, and because their most important characteristics are unseen to the unassisted eye, and hinden, except as revealed by chemistry, they are more frequently, than otherwise, misunderstood and carelessly manipulated to the deterioration of the finished manufactured product.

Curtailing Southern Yarn Production.

The cotton yarn spinners of North Carolina have met in convention at Charlotte, to discuss the present conditions of trade, which are most depressed. The mills chiefly suffering are those spinning No. 20s and under. A principal reason for the depression, in the opinion of those present, is due to the exactions of commission merchants, and the cancellation of con-

tracts upon slight causes. There was a general understanding that a curtailment of 30 days' production will be carried out within the next four months, which it is thought will be sufficient to wipe out the surplus stock, and place the spinners upon a more independent standing for controlling the price of their product. The purpose of the meeting was stated in the opening remarks of Chairman Anthony, to the effect that "something has to be done. The enterprise of manufacturing cotton in the South represents a great deal more than many of us think. First, it means a vast amount of money, and from the humane standpoint it means a vast amount of labor. It would be a calamity to have it stopped. What is to be done? If we go on at the present rate, the mills will be compelled to stop. In union there is power. The prices are lower now than the cost of production. If we could run on and keep even with the world, all would be well, but we cannot. By concerted action we can remedy this, I think."

One of those present reflected very largely the sentiment of the meeting toward commission merchants who have been handling the Southern product, in these words: "We have been robbed by these people right and left. In the first place they give us orders when the price of cotton is at a certain figure. If, in the meantime, the price of cotton goes against them, they cancel the order, no matter how far advanced we may have been in the fulfillment of it. There is no recourse but expensive litigation, with the probability of no assets if we gain the suit. Then, if the price of cotton goes against us, no matter how severely, we are held to its performance, because our mill plants stand as the bond. Thus you can see that we are cut in two, both going and coming. Nor is this all. We sell a consignment of yarns to a certain house at a fixed price, only to find on settlement that drayage, reshipment to other points and other costs have been piled up against us, cutting down our return one-fourth or one-third."

The convention passed the following resolutions: "Orders for goods shall not be conceded, unless agreeable to both purchaser and mill, nor shall any delay in delivery be allowed, except when agreeable to both parties concerned. We also think that commission rates should be reduced. That a curtailment of the production of yarns from No. 8 to 20 be made of 25 per cent. for four months, commencing June 15, 1897."

[From our special correspondent.]

Trade Conditions in Europe.

Conditioning Establishments—Testing Tops and Yarn.

II.

In my letter of last month, I referred to the system in vogue in Europe of conditioning wool, etc., for the purpose of ascertaining the percentage of moisture. The process of finding out the exact condition of wool is simple and accurate. In dealing with tops, as soon as the shipment arrives at the conditioning house, all the bales are weighed on a fine scale and arranged in lots of ten bales, from each lot of which one bale is made by taking two balls from each bale. One bale is entirely opened, and the balls therein used to replace those removed from the ten bales. The bagging of the bale made up from the 20 balls taken from the ten bales is carefully weighed. Thus the tare is found. From the 20 balls, samples are taken; from 17 balls only one sample is taken, from the inside of the ball; from two of the balls three samples are taken, one from the inside and two from the outside; and from one ball four samples are taken, three from the outside and one from the inside. These samples are all carefully weighed on a fine grain scale, sealed in a box and forwarded to the next process, where they are again weighed and placed in an iron cage,

which is suspended in a hot air closet with a heat of 90° Centigrade, and are left for 1 1-2 hours, after which they are taken out and placed in a cylindrical box, with a heat of 105°, and left for 35 to 40 minutes, after which they are taken out and placed in a box with the heat at 110° to 115°. On this last box is a scale, from which suspends the iron cage, with the sample top inside, which is continually weighed until it is seen there is no variation, which indicates absolutely no moisture or dampness; and from this bone-dry condition, without allowing the air to again reach it, the 18 1-4 per cent. is figured and added.

If the difference between the tops in this dry condition does not vary more than 18 1-4 per cent., the buyer accepts the tops on the face of the invoice, but if the tops are found to contain more humidity than 18 1-4 per cent., the seller must make an allowance of the difference between this percentage and the actual weight of the sample conditioned.

With yarn there is a still further process. The exact size, evenness and strength is determined to an exact degree. The case of yarn single, or two or more ply, is placed in the weighing room. If single yarn, ten bobbins are taken and weighed collectively for the size, and then each one of the bobbins is weighed, thus determining to an exact degree the size, as well as evenness, of the yarn. So careful is the weighing and measurement for size, that in reeling, each thread is laid evenly on the reel, and no overlapping of the threads allowed. Each skein wound on the reel is weighed. The length of each proof is 2500 meters, which enables the conditioning house to know the exact length after the same has been through the drying process. Yarn is weighed to centigrams and tops to decigrams. The yarn is also tested for strength. No delay is experienced in handling merchandise through the conditioning house. The bales are received, the samples taken out and the stock ready for shipment almost on the instant. So accurate is the weighing that the weight received and the weight delivered vary to the amount of the exact weight of the samples removed. The buyer and seller each share the cost of the test, which is slight. The managing director of the Tourcoing conditioning house is Arthur Boute, through whose courtesy the writer has been enabled to give the above facts. It would seem that a conditioning house is a necessity to trade. With it the rule of chance and conjecture on shrinkages ceases to be factors in our manufacturing industries.

LONDON, May 10, 1897. S.

(From our special correspondent.)

Trade in Chemnitz.

The American Tariff a Disturbing Element—Reform in Yarn Numbering—Black and Fancy Hosiery—Dress Goods—Business is Bad.

I herewith forward a few facts as to the textile situation in this section.

The American tariff question interests no one in our country more than it does the German merchants and manufacturers. Panic has taken possession of the textile centres. Nobody knows just what to do or which way to turn. Editorials dealing with the different details of the bill are exceedingly bitter. Leaders urge retaliation, some going so far as to urge the prohibition of American grains, cotton and petroleum. Hosiery that, before 1890, were made one at a time, on circular frames, and sold for $9.50 per dozen, are now made on new machines twelve at a time and sell for $6.50. Finding that the methods of years previous to 1890 could not keep the markets of the United States, machine makers invented and constructed new machines to do twice, thrice and in some cases ten and twelve times the amount of work of the old machines.

In order to avoid confusion in yarn numbers a commission was appointed

last year, at a textile convention in this city, to bring about necessary reforms in the numbering of yarn. A memorial is being issued to textile manufacturers, the object of which is to secure opinions and final favorable action on the movement for which the commission was appointed. The decimal or metric system will be used.

This city has suffered for ten years from America's persistency in wanting fast black hose. Effort after effort has been made to win women and men from this fatuous fondness for black. Fancies in all colors, in plaids, stripes, circles, etc., etc., have been tried, but with no success. The latest in Paris, still the world's centre of fashion, is a white silk stocking, embroidered with various flowers. Samples are in all the leading *bon ton* establishments. Every effort will be made to put them on the market. Chemnitz yearns for their success, for it means a revolution here, plenty of work, big prices and increased sales, for white soils so easily.

Variegated is as good a word as I can get to give a good idea of the newest thing in dress goods. Bright colors in the happiest combinations are being made up.

Business in general is bad, bad as it can be. No one has courage to begin anything new. Consternation is in all quarters. No branch but has had its hours of hesitation and horror. Manufacturers see safety only in a great curtailment of supply. Wholesalers and retailers report short sales. Spring trade is not nearly so large as was looked for, or hoped for; and autumn orders come in slow, small and marked with conditions. Machine makers are tumbling over each other in their efforts to get American trade, they and the trade thither sinking with each quarterly return. They are having their patriotism put to a test. Hitherto they have had to supply the home market, but they built on a rapidly rising trade. Now that demands are diminishing they must make a move into other markets.

Some months ago, a union was formed of all the big manufacturers. Its purpose was to crush out the system of the so-called factors or little people selling to American buyers direct. A great many of the little fellows laughed in their sleeves, selling as before to whomsoever they found willing to buy. It turns out, as I predicted, when the union was formed, that it was illegal. Action, I understand, is to be begun against it. It arrogates to itself the exclusive right of buying cheap and selling dear. It will get no mercy or assistance in the courts. One thing to be said about German justice is that it is mercilessly just. Rich and poor are regarded alike just as soon as they get into court. Influence counts for nothing.

Manufacturers of dyed dress goods in Greitz and Gera, have hardly enough orders to steadily employ half their help. Glauchau and Meerane, making fancies, have nearly enough orders for full time. Manufacturers of flannels and various cotton goods are doing only a moderate amount of business, due to dullness in the export trade, especially to So. America.

Hosiery trade is bad, bad, bad, especially in the low grades. Middlings go in small quantities. Plaids, however, hold the market at good prices. Manufacturers of these cannot get their orders filled.

Gloves and underwear are uncertain; with some safe, with others satisfactory, with others dull.

Renewed activity is everywhere reported in regard to industrial art and technical schools. These are the great facts in helping this Empire to export.

—C. J. Brown.

—In only a few districts of South Africa does it pay to breed solely for mutton. The fat-tailed Afrikander sheep produces mutton which, for delicacy of flavor, is probably unsurpassed by any other kind in the world, and no cross-breeding has ever improved it.

Artificial Silk.

THE CHARDONNET SILK SYNDICATE.

The recent inventions for the manufacture of artificial silk from cellulose or vegetable fibres, have excited the textile world to an extreme degree. Great expectations are had regarding the future of this material. Its utility, however, is not fully confirmed, notwithstanding the assertions of those most interested in its manufacture into fabrics. It is unreasonable to think that any great undertaking, as this is presumed to be, can come into existence full fledged, all perfectly equipped, Minerva like. The test of time and continued use must be applied before absolute assurance can be had of success. Great advances, nevertheless, have been made of late, which promise to give the industry the establishment wished for. An effort is now being made to manufacture the artificial silk into yarns and fabrics in this country. The location of the manufacture has not yet been decided upon. Before this is done, the necessary capital must be subscribed to.

In order that this may be accomplished, a certain number of men, prominent in financial and manufacturing circles, such as S. V. White, New York, F. C. Sayles, Pawtucket, R. I., W. B. Plunkett, Adams, Mass., and others, are interesting capitalists in a scheme of organizing a company with a share capital of $5,000,000, to control the American patents and rights of Count Hiliare De Chardonnet's process for the manufacture of artificial silk and all of its improvements, for the United States.

In order that the patents may be purchased at a cost of $250,000, and a suitable plant be erected at a cost of about $150,000 more, offers have recently been made for the disposition of 4000 shares at the par value of $100 each, the purchaser being entitled to a bonus of one share for each share subscribed. This practically means the raising of $400,000 and the disposition of 8000 shares. The working capital is to be obtained from the sale of the treasury stock, or so much of it as is necessary.

The company will be incorporated, probably, under the laws of either New Jersey or Maine, and the principal manufacturing establishment erected at Paterson, N. J. This location seems particularly suitable, from the fact that the most desirable class of help can be obtained in its neighborhood, as the machinery required will be, in its essential features, like that employed in the manufacture of natural silk.

Count Chardonnet, the inventor, is a scholar of the Polytechnical School of France, and Knight of the Legion of Honor. The invention gained the grand prize at the Paris Universal Exhibition, and two grand prizes in the textile and chemical classes of the Lyons Exhibition. Under the patents to be acquired by the American company, wood, cotton waste and other vegetable fibres are assimilated and spun, at a cost to the manufacturer of about $1 per pound.

The company to be formed will have an exclusive monopoly of the American trade, as the foreign product cannot be imported, as being contrary to the agreements made between the owners of the patent and the licensees in England, and on the continent.

Factories have already been established at Besancon, France, Sprietenbach, Switzerland, and works have been erected at Fismes, in France, and a license granted to Maurice Dennis to manufacture upon royalty. A factory is now built in England, at Brandon, near Coventry, which covers an area of about twelve acres, for the purpose of manufacturing artificial silk yarn exclusively for the English market.

This silk has been woven with wool and other yarns in France and England; in Lancashire, in combination with cotton, and in Coventry, in combination with silk; standing, it is reported, all the varying tests of the

manufactures. These goods are capable of being utilized in the manufacture of tapestry, dress goods, ribbons (plain, fancy and watered), braids and cords for dress trimmings, twists and embroidery for fancy work, covering for indoor electric light wires, neckties, scarfs, belts, hat bands, silk braids of straw hats and bonnet shapes, for mixture with silk, cotton, woolen and linen goods.

The inflammability of artificial silk, which condemned it when first introduced, has been practically overcome by chemical means, so that now it is really less combustible than the natural silk. This was demonstrated to us at the time that Mr. White and others were in Boston to secure capital for the syndicate.

Spruce is preferred as the wood from which silk is to be made, on account of its containing a larger quantity of gum. The wood is first reduced to cellulose by being macerated between stones which very much resemble those used to grind corn in our old mills. It is then thrown into a vat containing water and certain chemicals, for the purpose of reducing it to a pulp. It is then forced through pipes to another vat where it is reduced to gelatine and then goes to another vat to be clarified and in the final process is stored in big tanks connected by pipes with the winding room. Winding frames similiar to those used on pure silk are in this room, and the pipes leading from the supply tanks pass directly under the machines. At intervals along this pipe are openings corresponding to the number of counts desired to a strand. In these openings are fixed small glass worms with metal sockets, the orifice in which is so fine that a microscope is necessary to discern it. Directly in front of this pipe is the drying cylinder, which is heated by steam. In winding, the pressure on the supply pipe forces the gelatine from the end of the worms, the operator gathers up the number of ends desired, passes them around the drying cylinder and puts them on the bobbin. The heat hardens and dries the fibre thoroughly and it is ready for use as soon as it has left the cylinder. It is made ready for the dyer in skeins the same as raw silk, and is sold by the kilo. One important point is that the entire throwing process necessary in the preparation of pure silk is avoided, as the artificial silk is ready for the dye as soon as it comes from the winder.

Technical Education.

Editor Textile World:

I see that you take a very great interest in technical education, and shall send you soon some of the best works, or pamphlets, published thus far on this subject, viz: Report of the Parliamentary Recess Committee, and a report of an English commission. In my opinion, the people of the United States will solve the question of tariff legislation beyond the power of politicians, the day they are given technical and industrial art schools, such as those one sees in Germany, France, and elsewhere on this continent. It is time to urge their great advantages on the American people. As a Boston boy by birth, loving the grand old commonwealth, I confess feelings of pride in the steps that have been taken to forward technical education in Massachusetts.

This old world is doing wonders in the way of technical, industrial and industrial art schools. Even Switzerland, hundreds of miles from the sea, exports enormous quantities of manufactured goods, because she has built up and maintains a most excellent system of technical education. How much these aid manufacturers, the history of Swiss and German progress proves. The little republic has some of the very best scientific and trade schools in Europe. St. Gall gives the United States and other countries millions of dollars' worth of lace goods, because St. Gall has one of the very

best lace schools in the world. The work done by the girls and boys that go out of this school would be remarkable, were it not for the fact that French and German schools are doing work equally good. Switzerland has, in 1896-97, 13 trade schools in active operation. These are not only supported by the State, but scholarships are granted to deserving lads and lassies. Particularly bright boys or girls are not only given a chance to get all that schools like St. Gall or Zurich can afford them, but are sent to Paris, Lyons or Milan, to see and get as much as the great schools of other manufacturing centres supply. Nor is it the needs of huge cities alone that are looked after. The smallest place in the Republic is not too small for the intelligent and fostering care of the commonwealth. In Switzerland they have schools for every industry, and, many times, schools for different branches of the same industry. Not what we are, without such schools, but what we would have been had we had them, or might be with them. Not what the Swiss, French and Germans are with them, but what they would have been, or would become, without them, are the questions to ask and answer. "The nation that has the schools has the future," was one of Bismark's best and favorite aphorisms.

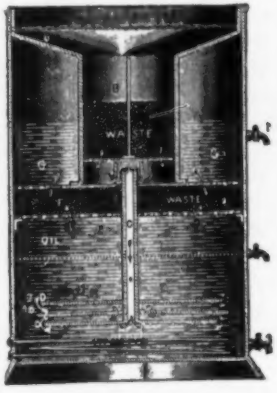
J. C. MONAGHAN.

CHEMNITZ, SAXONY,
May 13, 1897.

Waste Oil.

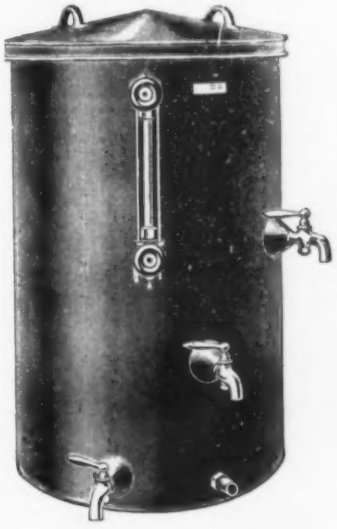
Every user of lubricating oil appreciates the fact that the larger portion of all the oil he buys is not consumed by the machinery on which it is used, but passes through, and, but for the fact that it becomes filled with dirt and grit, could be used again. Because of the dirt and grit in it, however, it is thrown away as waste oil. This waste frequently amounts to from 50 to 75 per cent. of the oil used. The lubricating properties are not affected in the least, and if the impurities can be eliminated, the oil is just as good as new.

One of the best-known oil filters is the Cross oil filter, illustrated herewith, manufactured by the Burt Manufacturing Company, Akron, Ohio. These filters are made in various sizes, with capacities ranging from 3 to 120 gallons per day, and are constructed of iron, brass or nickel-plated copper. The oil to be filtered is poured in the chamber *B* through the sieve on top. It then passes through the layer of waste which holds all of the heavier impurities contained in the oil, and then passes through the tube *C* and into the filter plate at the bottom. The water, however, tends to keep the oil in the tube,



but the pressure of the oil in the upper chamber forces out the oil in the tube and spreads it over the filter plate in a very thin film, which exposes every particle of the oil to the action of the water contained in the lower part of the filter. The oil then flows upon the other two filter plates, on leaving which it is in a finely divided state of separation and thoroughly mixed with water, which cleanses it. The oil and water then separate by gravity, the water carrying with it all of the remaining impurities from the oil. The impurities settle in the lower chamber and can be drawn off through cock 3. The rising oil then filters through the layer of filtering material in the middle of the case, and collects in the chamber *G*,

where it can be drawn off, thoroughly cleansed. The water in the bottom chamber is kept warm by means of a steam pipe passing into and out of the receptacle. This filter is in use by the



largest mills in the United States, China, Japan, India and Russia.

Southern Competition.

C. W. Dennett, agent of the Johnson & Dunbar Gingham Mill of North Adams, Mass., submitted very recently to an interview, which was published in the Berkshire Democrat, covering his observations in the manufacturing sections of the South. Mr. Dennett was sent to the South by certain parties, who were considering the matter of investing capital in Southern cotton mills, for the purpose of investigating the industrial conditions there, and to see whether they were favorable or not for an investment of this kind. In the interview, which we are informed was dictated by Mr. Dennett, the following observations are made:

"A modern brick mill can be built at least twenty per cent. cheaper South than North in the average location. Including foundation it can be erected South for 50 cents per square foot.

"Water power, if ample and easily developed, is cheaper than steam. The cheapest coal in the South is about Anniston and Jacksonville, Alabama, where I had it guaranteed at $1.50 per ton. At this price experts would not put the cost of power less than $12 to $15 per horse power per year. With $1.50 coal, power would cost only one-half what it costs the average New England mill using steam.

"Comparative labor cost is not so easily determined. To be sure of your ground, it is necessary to have like manufactured product, as well as the same comparative unit to make a correct calculation. I think it would be safe to say that labor in the cotton mills in the South is from 25 per cent. to 40 per cent. cheaper than in the North. By this I mean that the net earnings of the operatives are from 25 per cent. to 40 per cent. less, and in some cases 50 per cent. less. I saw the pay roll showing the actual earnings of the weavers in a large colored mill in North Carolina, and they did not average over $4 per week. From $3.50 to $4.50 per week would include most of the names on the pay roll.

"You can purchase cotton at from 3-4 to one cent lower in the Southern Atlantic States than at the New England mill, and in Arkansas they guarantee it at 1 1-4 to 1 1-2 cents less. In making this statement it is to be remembered that they classify at one grade higher in the South.

"Undoubtedly, what is called the Piedmont region, from Lynchburg, Va., to Atlanta, Ga., is to be the manufacturing belt in the South. Climatic conditions are on the whole, I think, as favorable to the manufacture of cotton goods from 40's yarn and under as in the North, taking into consideration the new improved methods of artificially controlling the humidity and temperature inside the mill.

"Families formerly living on poor

farms, eating the coarsest food and dressing in the simplest manner, are transferred to the mill districts, where tenements are provided by the corporations, and opportunity given for all the members of the family to work. They earn from, say, two to four dollars per week, and see more money in one month than they had formerly been in the habit of seeing in twelve months. They are comfortably housed, their clothing costs little, they have a garden and usually a cow, some pigs and hens, and they know next to nothing of the thousand and one luxuries to which our Northern operatives are accustomed; consequently their wages are to them relatively as high as the wages of the New England operatives."

The South has the disadvantages of higher interest on money, and higher transportation cost.

Spindles Required in Japan.

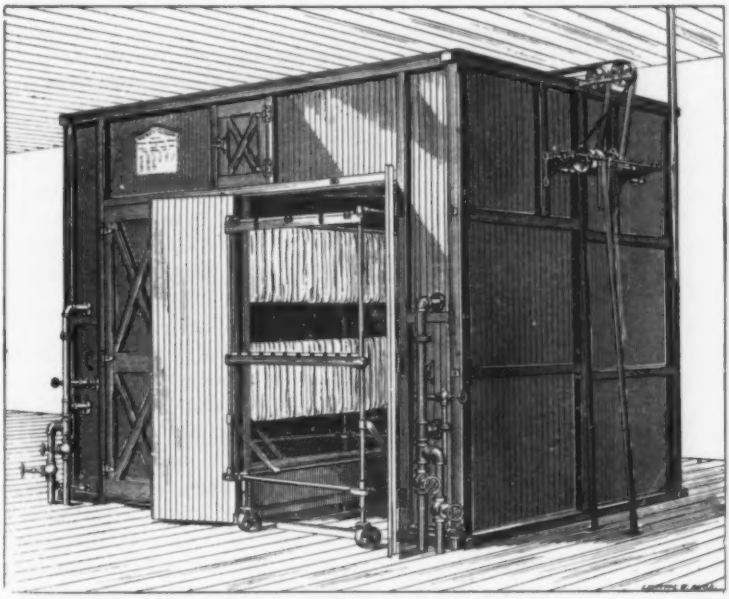
How many spindles will be sufficient to turn out the cotton yarns demanded in Japan is an important question of the day among the cotton spinners. Two or three years ago, it was expected that 500,000 or 600,000 spindles would be sufficient for the home demand, but since then the spinning trade has made rapid strides corresponding to the general advance on the part of the people; especially after the war with China, one spinning firm after another has newly sprung up, and the result is that Japan has now some 700,000 spindles. If to this be added the number of spindles to be purchased by mills under contemplation, the figures will be as large as 1,000,000. It is evident, not only from the history of the industry in other countries, but also from our own experience, that the demand for cotton yarns and fabrics will increase more and more, particularly as Japan is now determined to rank among the civilized nations of the world; for no one can fail to see an enormous difference on comparing such demand before the Restoration with that of the present. The undeniable fact that the wants of the people expand as they progress toward the civilized mode of life, is proved by the fact that the rags in which the farmers and fishermen of the north were used to be clad are now sent in large quantities to paper mills of Tokio, to be turned into paper, while these poorer people are now dressed in new cotton cloth instead of rags. Such being now the life of the people, it is natural that the demand for yarns increases every year. True, some yarns have been exported to Corea and China this year, but it cannot be denied that home produce is quite inadequate to meet the home demand, especially with regard to the finer numbers, which we are still unable to manufacture. Hence, the import of yarns, including the coarser numbers from Bombay and finer numbers from England, during the ten months ended October 31st last, amounted to 10,013,367 kin, equal to 9,509,576 yen (value of a gold yen is $0.997 in United States currency), which shows an increase of 4,371,946 yen on the corresponding period last year. In order to stop this import, then, Japan will require several hundred thousand spindles more, especially as she is now extending the markets for her yarns in China and Corea.—[Ashai.

Cyclone Truck Yarn Dryer.

The Philadelphia Textile Machinery Company, cor. of Hancock and Somerset Sts., Philadelphia, are building a small yarn dryer like the accompanying illustration, which is a most convenient, effective and economical one for quantities of yarn varying from five hundred pounds to four thousand pounds per day. For larger quantities they recommend their large automatic dryer as being more economical.

The cyclone truck yarn dryer herewith shown will dry two thousand pounds of cotton yarn or four thousand pounds of wool yarn in ten hours. It

covers a floor space of but thirteen feet, eight inches by nine feet, seven inches. It has also been recently demonstrated that these dryers are excellent for drying the finest of fabrics, such as silk, and machines have been installed for this purpose with Cheney Bros., of South Manchester, Conn., and L. D. Brown & Sons, Middletown, Conn., and are giving good results. This dryer, in comparison with any room drying system, gives economy in labor, floor space and heat, coupled with perfect comfort to the operatives, and a superior drying of the yarn. It is an outgrowth of the company's well known room dryer, embodying its good features with substantial improvements. In this dryer, the yarn is poled, placed on trucks and run into the dryer, where the drying is effected by one of the company's patented methods of re-circulating heated air in large volumes alternately through the goods and the steam pipes contained in the air passages on each side of the dryer. The system of recirculation is such that, even when the doors are open, practically no heat escapes from the dryer, which feature renders it practicable to locate it in the same room with other machinery, without making any material difference in the temperature of the room. A small opening at the top admits of the moisture being carried off through an ordinary sheet iron pipe. The truck is drawn out when the drying is completed, thus avoiding the baking of the yarn, which occurs in dry rooms generally.



CYCLONE TRUCK YARN DRYER.

The dryer consists of a substantial frame work of yellow pine and poplar mortised, tenoned and securely joint bolted, sheathed in with No. 1 grade kiln dried beaded fencing. It is shipped in parts of convenient size for handling, and can be readily set up by the average mechanic. The fan, counter shaft and other working parts are sufficiently heavy to do the work, and are of substantial design. The heater coils are carefully constructed, and are tested by hydraulic pressure to insure a tight job. Those who are using the

truck yarn dryer speak of it in the highest terms of praise, all of which it fully deserves. Its work is all that could be desired. In fact, anyone requiring a small yarn dryer cannot do better than get one of these dryers. It is a first-class machine, and, we are told, of reasonable price.

Among the Dry Goods Trade of New York.

James Talcott has secured one of Vietor & Achelis' salesmen, in the person of F. A. Sollace.

Charles D. Roby, late with O. H. Sampson & Co., has signed with Bliss, Fabyan & Co.

David Simon, of J. R. Simon & Co., importers of Japanese silks, has gone to Japan.

The Barnaby Mills, of Fall River, have a new office in New York, in the New York Life Building, with A. H. Broadway in charge.

Some jobbers and wholesalers are adding cycles to their stocks, to keep pace with the department stores.

Maurice Jacobs, of Canal St., has issued a bill of sale to the H. B. Claflin Co.

This committee is adjusting the business of the insolvent Gilbert Mfg. Co.: Otis N. Pierce, Grinnell Mfg. Co., New Bedford, chairman; John Waterman, Warren (R. I.) Mfg. Co.; J. O. Sweet, Ashland Cotton Co., Jewett City, Ct.; I. D. Blodgett, of Bliss, Fabyan & Co.; J. Galt Smith, of J. Galt Smith & Co.

A. H. Fisher's glove accounts have gone to H. H. Schweiting & Co.

An attachment has been secured against Morris Lewenthal, of 20 Lispenard St.

Porter Bros. & Co. have taken charge of the New York branch of the Jackson Corset Co.

J. H. Sweetser, of Sweetser, Pembrook & Co.; Wm. E. Tefft, of Tefft, Weller & Co.; John Claflin, of the H. B. Claflin Co., and Chas. H. Webb, of Dunham, Buckley & Co., have been chosen to represent the dry goods interest in arranging for a merchants' excursion the coming fall.

Several dealers tried to attach the stock of Max Olitsky, cloak dealer, at 140 East Broadway, but could find no stock, everything having been moved away. The goods were finally discovered in the hands of an auctioneer.

The towel, etc., accounts of Root, Childs & Co. have been transferred to Whitman & Phelps.

The death of Emil Oelbermann takes from the dry goods trade one of its best known figures, and also leaves a gap in the underwriting fraternity. In addition to being at the head of Oelbermann, Dommerich & Co., he had been for twenty-five years president of the German-American Insurance Co., of which he was one of the founders. The concern of Oelbermann, Dommerich & Co. is the largest importing and commission dry goods firm in this city.

Geo. F. Boyle, who has been buyer for Denholm & McKay, of Worcester, has allied himself with Simpson, Crawford & Simpson, of this city.

August Weil, of Weil, Hackell & Co., has gone to Europe.

Speaking of that concern, it is said the firm recently sold John Wanamaker eight car loads of shirt waists.

Bernhard Cohen, of S. M. & B. Cohen, of New York, is dead. Many years ago he conducted business in Syracuse and Mobile. He had held several important public offices.

J. G. Clark, formerly with Converse, Stanton & Cullen, is manager of Lawrence & Co.'s new underwear department.

An improved demand for ginghams is reported.

A. W. Openhym, of Wm. Openhym & Sons, has gone to Europe.

Collections seem to be very good among most jobbers.

Andrew A. Wood & Co. is a new concern at 62 White Street. It will import linens and act as manufacturers' agents. The company is A. G. Findlay, who was linen and white goods

salesman with Arnold, Constable & Co.

The death of Fred. H. Trowbridge, 84, of Brooklyn, is noted. Many years ago he was with the firm of Hoyt, Sprague & Co.

Road salesmen say that spring trade has been much better than most retailers expected.

The Henry E. Frankenberg Co. has been incorporated with $150,000 capital. It will be located on Broome St. Joseph C. Sherader, W. V. Frankenberg and H. E. Frankenberg are the prime movers.

Now that Philadelphia and Chicago have usurped New York's department store business, New York capital will attempt to invade Chicago. A department store is being planned for the windy city by Emil Kleinsmith, which will require an issue of $4,000,000 in bonds. It is planned to have music eternally, on tap at the store, which will be so constructed that carriages can be driven into the middle of the building.

Newell Bliss, who recently died, had during his lifetime been connected with Hill, Hyde & Co., A. T. Stewart & Co., L. M. Bates & Co., and several other concerns.

Charles Webster, the resident buyer, has become representative for Fowler, Dick & Walker.

Silk manufacturers are said to be almost at their wits' ends for designs. Satin grounds overlaid with large brocade figure effects promise to be particularly popular.

The Altmayer Bros. assignee sale of 6500 dozen underwear is admitted to have brought good results.

Thos. Thatcher, who died last week in New York was an old Boston dry goods man, having succeeded to his father's business, in Yarmouthport, 50 odd years ago. He was easily a millionaire. He prided himself on two things: That he once foreclosed a railroad on Jay Gould, and that he never lent a man a dollar.

G. Ballin, of G. & J. Ballin, importers, has gone to Europe.

A representative of Morimura, Arais & Co., raw silk importers, who is in New York, says that the Japanese silk market is very quiet, as stocks of sizes suitable for the American market have been cleared up.

Wm. Simpson, manager of John S. Brown & Co.'s linen account, has gone to Europe.

Manufacturers are certainly pushing for export trade. A local drummer recently met five representatives of American concerns in Rio Janeiro.

C. P. Ayres, representative of Robt. Watson & Sons, linen manufacturers of Lingan, Ireland, has gone to Europe.

Gibelines or scratch napped goods are looking up for fall. Rich colorings are shown in plaids, scrolls and geometric figures.

Nathaniel Warden of Wright, Young & Graham, linen importers, has gone to Europe.

The dry goods trade having been represented in the mayorality chair of W. L. Strong, wants more, and talks of C. N. Bliss of Bliss, Fabyan & Co. and E. M. Townsend of Townsend & Yale as candidates to succeed Mr. Strong.

E. B. King, of King & Beals, has gone to Europe.

Louis Wayne, late of Fort Wayne, Ind., has become a resident buyer.

The dry goods league is holding forth in the Lyons building, 491 Broadway. A chef is now in attendance.

W. Wesendonck of Wesendonck, Lorenz & Co., has gone on a Southern pleasure trip.

Oscar R. Meyer & Co. have moved to the silk exchange building.

Henry Batterman of Brooklyn, recently celebrated the 31st anniversary of his business, by giving a dinner at his house to the heads of his departments.

The Uptown Association, mostly made up of dry goods men, recently blackballed Henry Seigel, of Seigel, Cooper & Co., at which action, J. C. Ward and

J. I. D. Bristol, who presented his name, were very wroth. They behaved so, in consequence, that they were expelled. Then they carried the case to the court of appeals which has just sustained the club.

Style Suggestions for Woolen Manufacturers.

The general feeling is that the opening of light weight lines will necessarily be late this season, caused partly by the lateness of the heavy weight season, also by the uncertain tariff legislation. The clothiers are commencing to place duplicates on heavy weights, and from the size of duplicate orders, there is a certain indication of the revival of business. They are largely on suitings, as these seem to have had a larger and better sale than trouserings.

In the coming season the general tendency will be towards light colors, and the gray tans will be the prevailing tone of shades. Worsted cheviots and cheviot effects of all kinds will be very little in demand, the larger portion of business being done in the half melton finish fabrics. Worsteds in medium priced goods for trousering will sell, but the prevailing idea is the firm cassimere with a melton finish. Twist effects in this line of fabrics are also the best styles to make, the larger neat plaids, being in demand; but care should be exercised that the colors do not contrast, so that the plaid presents block or square effect, as this is very undesirable.

Some merchants are clamoring for a dollar kersey. While the trade seem to demand this, it is a delusion and a snare, for more money has been lost trying to produce this than in any other fabric for many years. Of the half dozen or more makers producing dollar kerseys a year ago, three of them have failed and the balance have shut down or are producing something else; so from the experiences of other manufacturers, dollar kerseys are not desirable things to make, not alone for this reason, but because kerseys are fast losing the limited demand there is even now for them.

Wool Market.

The wool market for the last month has been quiet to active, which state of affairs has caused the holders of wool to feel confident that there is a prospect for a substantial profit in their stocks. Prices are lower than those prevailing two months ago, but are about 10 per cent. above the level existing at the beginning of the year. There is an immense amount of foreign wool in the warehouses, enough to meet ordinary consumption for nearly twelve months to come. Some of the selections of foreign wools that were made at the recent London sales are of very high order, many of them shrinking under 50 per cent. These lots are desirable property to hold. As all of the large mills, in good credit, have a large supply of wool on hand, the demand will probably remain slight for at least six months to come. Occasionally, a weaker holder is found who is willing to part with his wool 1-2 cent under ruling prices. These are exceptional cases, however. Tops are advancing abroad, and, owing to the large purchases on American account, fine wools are scarce on the other side, which will have a tendency to advance prices for this kind of wool just as soon as the continental demand develops.

Woolen mills are busy with orders that have been in hand for several months. The greatest complaint is that there is a lack of new orders or of re-orders at the recently advanced prices.

Growers in the West are holding their wool for better prices. Very little Texas wool has made its appearance, but a considerable quantity is said to be on the way. Twelve months' growth is sold on the basis of 36 to 37 cents

clean. Fine medium territory wools are bringing 35 to 36 cents clean. These wools from Wyoming, Nevada and Idaho are coming along freely. Better prices than these are expected after the passage of the revised tariff. The selections of domestic fleeces are ordinary. Ohio XX and above is held at 21 to 22 cents, and X and above at 19 to 20 cents. Michigan X is held at 17 to 18 cents. There is little being done in combing and delaine wools, these being held at 22 cents for Ohio, and 20 cents for Michigan.

Cotton Market.

Outside the state of Texas all accounts concerning the growing cotton crop are the reverse of last season, due to the prevalence of cold weather during the month of May, and thus far in June. The plant, up to the present writing, is small and backward, although it is possible for it to regain what it has lost before harvest time, provided there are highly favorable weather conditions. Should the cotton mills continue to run through the summer months there will be a very short supply of cotton before the end of the season. From present indications, however, this is not likely to take place, as the mills both North and South are pretty sure of curtailing production very considerably. While unfavorable conditions exist outside the State of Texas, it should be borne in mind that this State produces at least 25 per cent., on the average, of the total crop. With an estimated acreage of 24,711,382 acres, the prospects are quite as favorable, even under no more than ordinary conditions, for a crop of over 9,000,000 bales as under. If the running of the mills were an assured thing, the price of cotton should be at least half a cent a pound higher than it is now, as the statistical position is extremely strong. Up to the present time, the takings of American spinners are but little more than at this time last year, that is, about 100,000 bales more. The receipts thus far assure a commercial crop for the season of 8,600,000 bales, approximating very closely the early estimates.

Foreign Textile Machinery.

The statistical reports showing the exports of textile machinery from England, exhibit an increase over those for the corresponding period (January to April inclusive) of 1895 and 1896. The exports for this period of four months amounted, in 1895, to £1,966,582; in 1896, to £2,202,252; and in 1897, to £2,252,976. The value of the exports to the United States for these years amounted, respectively, to £150,589, £255,443, and £73,597. It will thus be seen that the exports to the United States were very much less during this period, this year, than for the two preceding years. The exports to Germany, France and Japan were considerably more than for either 1895 or 1896. Japan is becoming one of the largest customers for English machinery of any foreign country.

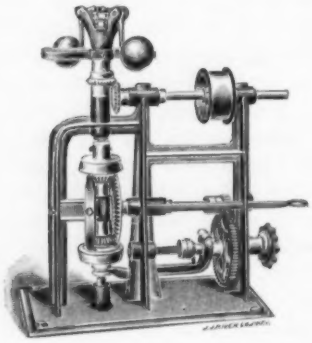
National Association of Woolen and Worsted Overseers.

The semi-annual meeting of this association was held at the United States Hotel, Boston, Mass., May 26th. The meeting was called to order by President George F. Maguire. There were 41 members present. Twelve new members were admitted to the association, and six were added to the honorary list. Among the latter may be mentioned E. W. France, director of the Philadelphia Textile School, and C. P. Brooks, director of the Lowell Textile School. The idea prevailed that an association pin should be designed and worn by the members. A committee was appointed to look into this matter, and report at the next meeting. Several interesting papers were read.

Water Wheel Regulator.

MANUFACTURED BY C. P. BRADWAY.

The water wheel regulator which we illustrate herewith, manufactured by C. P. Bradway, West Stafford, Ct., has but recently been placed upon the market. Its construction is very simple, yet it is most efficient. There are two frictions, connected with two pinions, which alternately act on a bevel gear, driving the shaft in either direction, thereby opening or closing the wheel gate, as may be required. The balls of



the regulator are driven at a high speed, and will maintain an almost exact uniformity of speed in the shafting, as one or two revolutions of the shaft is quite sufficient for the regulator to act.

There are no pawls or ratchets to wear out. The motion is direct and continuous, until the proper speed is attained, when the friction is released. It will run without moving the gate, unless the load is changed. The screw and lever at the bottom is to throw out the friction when the gate is fully open, so as to cause no injury in case the wheel is overpowered. The builder informs us that this regulator will be sent to any responsible party, with instructions for setting or connecting to the wheel gate, on trial.

Mr. Bradway also manufactures turbine wheels and water motors. He guarantees his turbine to give most excellent results with variable quantity of water, due to its peculiar gate construction. The full gate principle is introduced at all stages of the gate opening. The wheel will sheer off obstructions. One, two or three wheels can be set on one base, and can be adapted to any conditions.

Feeding Cotton on the Picker.

Editor Textile World:

In your April number, I notice a communication on this subject, in answer to the query: "Can not more even work be obtained by weighing the feeding with a counterpoise made of an equal weight of cotton?" In my opinion, this can not be done. In the old system of handling the stock in a picker room, the cotton was first run through a picker, from which it was delivered in a loose, fleecy condition. The cotton was then spread on the apron of a lapper, then called a spreader, now called a breaker or intermediate lapper, the lattice of the machine being spaced off in equal divisions, upon each of which the lapper tenter spread a certain weight of cotton. The scales upon which these portions were weighed were in some mills, weighted by means of a certain quality of raw cotton, the idea being that in damp weather the weight would absorb as great a percentage of weight from the moisture as would the mixing. When the spreader was run by a steady careful man this system gave very good results, but there was so much room for carelessness that, as I remember it, there was a good deal of variation in the weight per yard of the laps; then the pickers with lap heads were introduced, labor was saved, and the work was decidedly better on the average. I remember the old style spreader, the scales being fastened near the machinery. On one end of the scale, a good sized tin scoop was fixed, and on the other end a tin can, punched full of holes like an old-fashioned lantern. This tin packed full of cotton, was, in fact, the weight. In the modern system of picking room

machinery, the cotton is regulated by the thickness or bulk of the cotton passing between the regulating surfaces. On the automatic feed when a heavier lap is desired the stripper is moved farther away from the apron. On the lappers the feed regulator is so changed, when a difference in the weight is desired, that a greater or less bulk passing under the regulator is needed to move the cone belt. For example, if the lap is wanted lighter in weight, the regulator adjustment is set so that the feed roll will be driven more slowly when the same thickness or weight of lap is passing through. T. B. C.

An Explosive Sprinkler.

A new sprinkler has been invented that comprises a charge of explosive material adapted to suddenly generate a great pressure when acted upon by a temperature slightly higher than is required to release the fusible fastening of a sprinkler when it is new, and in this way to force the valve and other movable parts away from the sprinkler. It is designed that the sprinkler shall open when a strut is melted in the usual way; but on failure to melt open, the sprinkler is forced open. The smallest cartridge that is made will remove a valve from a sprinkler even when it is secured therein by a steel wire, so great and so well directed is the sudden pressure. The new sprinkler is capable of having its explosive charge set to go off at any desired temperature above 140 degrees Fahr., and the explosive device is readily applied to those sprinklers that are already in place and awaiting to be called into use by a fire. The patent for this invention has just been issued to C. E. Buell, North Plainfield, N. J., and also one to the same inventor for a turning-on valve mechanism for use with sprinkler system. The true merits of the sprinkler have not been passed upon by the insurance companies.

Bleaching Cotton Piece Goods.

To bleach pieces of cotton, says Reimann's Færber Zeitung, prepare for each 100 kilograms (220 lbs.) of goods a lye of 10 kilos (22 lbs.) lime and 10 kilos calcined soda, and let stand to settle. The clear liquor is then decanted and entered into the kettle or vat. It is suitably diluted (2° to 2 1-2°B) the material entered and boiled from 1 to 2 hours.

The boiling takes place in the open kettle. The fabric is then thrown out, passed through cold water, washed in the washing machine, and entered into the chlorine bath. This consists of 1 kilo, 800 grams (3 lbs. 10 oz) of chloride of lime ground in cold water. It is best to rub the lime in a finely perforated iron drum revolving in a vessel with cold water. Iron balls in the drum do the grinding. The chloride of lime milk is then passed into the chloring apparatus, and must be 1-2° B strong. The fabric is either passed in the machine through the liquor, or else immersed in it for 30 minutes to one hour; it is next worked and acidulated.

The water used for the dissolving of the lime must be as cold as possible, otherwise the chloride of lime decomposes readily, and thereby loses its bleaching effect. Chloride of lime must be bought only on the "hand to mouth" system, experience having shown that it cannot be stored for any length of time—the longer it lies, the more it loses its strength. A larger quantity of chlorine is required if the fabric is rinsed after chloring, as hereby the larger part of the agent is lost. It is advisable, therefore, not to rinse after this operation, but to enter at once into the acid bath.

The acid bath consists of hydrochloric acid of 1-2° B strength, through which the fabric is run for 30 minutes; it is then at once washed in the washing-machine until all traces of the acid have been expelled. This finishes the bleaching operation. Minute traces of

chlorine will unavoidably remain in the fabric, and it is necessary, therefore, to expel them. This is done best by treating the material in a cold bath containing 12 1-4 oz. bisulphite of soda. If the chlorine were left in the fabric, hydrochloric acid would be formed, which is highly injuricus to the fibre. After the treatment with bisulphite the washing must be repeated.

The fabric is blued after coloring. For this bath 160 grams red, tinged ultramarine are stirred with 1 kilo (2 lbs. 3 1-4 oz.) white glycerine and the solution of 300 grams (10 1-2 oz.) calcined soda into a homogeneous fluid. Sufficient of this fluid is added through a batiste filter to the cold blueing bath till a white porcelain plate held four inches underneath the surface shows the desired blue color. The fabric is passed through this bath, and then squeezed or whirred and dried. It is cheaper and simpler to blue with red tinged aniline blue, but better with methyl-violet.

For reasons of economy no soda lye, but only lime was formerly used for boiling the fabric. For 100 pieces, equal to 400 kilos fabrics, were slaked 18 kilos (39 7-10) burned lime. The fabric was passed through a narrow box furnished with rolls, in which it became impregnated with the lime. It was then squeezed, entered into the boiling apparatus and boiled. Spots were frequently caused by this treatment, as the lime formed an insoluble resin soap with the resins of the cotton, which could subsequently not be removed again. For this reason the method was changed to boiling with the two agents.

Red.

Red is a color which plays a most important part in textile coloring; possibly no other color is so much used. The number of hues, tones or shades of red which can be produced are infinite, and are beyond the scope of any language to describe. Taking what might be called normal shades, we have reds, ranging from yellowish tones; the scarlets, to the bluish tones; purples, or crimsons; the scarlets being the brightest, the purples or crimsons being less bright. The light tones are usually known as pinks, while the dull shades are known as maroons, clarets, etc. From a fundamental point of view, the different hues or tints are formed owing to the action of the dyestuff on the light which falls upon it. The scarlets, when used to their normal amounts, permit the reflection or transmission of the whole of the red portion of the spectrum, together with a portion of the yellow, the whole appearing to our eyes as scarlet. The crimson and purples absorb all the colors of the spectrum except the red, the purples only allowing the extreme portions of the red to pass; while the crimsons permit nearly the whole of the red portion to be reflected or transmitted. The normal hues of red permit the rays to pass in almost the original intensity, there being but little actual absorption of the light falling on the object. On the other hand, in the case of the dark reds, clarets, bordeaux, maroons, etc., there is a considerable absorption of the light, which absorption causes them to appear dull. On the other hand, in the case of the light tints, pinks, etc., there is a large proportion of white light reflected along with the red rays, the amount of coloring matter used, or the peculiar properties of the dyestuff used, not being sufficient to lead to the absorption of the other colors than red, and those which are reflected modify the tone of the pink.

Red gives the appearance of warmth to any design in which it occurs, or to any cloth dyed red. This is not a mere sensation, for it has been shown that the spectral rays vary much in their heat power, the hottest part of the spectrum being at the red end, or a little beyond it. In designing a harmonious combination of color, it is de-

sirable not to have too much red in it, and to balance that which is used by the employment of green or blue.

Cop Dyeing.

Cop dyeing has never been considered a success, due to the great difficulty of obtaining uniformity of shade throughout the cop. This difficulty, however, is thought to have been overcome by a recent invention, consisting of an apparatus designed first to exhaust all the air from the interstices in the yarn, to impregnate the latter with the dyeing liquor, both from the outside and the inside of the cop alternately, and to withdraw the surplus liquor from the cops before they are removed from the dyeing chambers. Those who have seen the operation speak in very high terms of the results. The backward and forward flow of the liquor through the cops, and the entire exhaustion of the air before they are treated with liquor, insure a uniform shade.

—According to the recent statistics of the Treasury Department, Washington, the value of the carrying trade for the month of March, 1897, showing the distribution, by flag carrying vessel, of the value of the imports and exports of the United States, was $76,344,946 imports, and $85,411,235 exports, or a total of $161,756,181. Merchandise to the value of $17,662,033 was carried in American vessels. Merchandise to the value of $136,128,167 was carried in foreign vessels, and merchandise to the value of $7,965,991 was carried in cars and other land vehicles. Over 70 per cent. of the merchandise brought in foreign vessels came under the British flag. Only about 11 per cent. of the foreign trade was brought in American vessels.

Miss Gummidge—"I don't see why they call them clocked stockings. They never tell the time."

Preston—"Except on muddy afternoons, and then they very often strike one."—*Remarques.*

A Discriminating Duty.

There is before Congress a bill for the amendment of the revised Statutes of the United States, imposing a duty of ten per centum ad valorem, in addition to the duties now imposed by law, on all merchandise imported in ships or vessels not of the United States; and in cases where no duties are imposed by law on such merchandise, there shall be paid a duty of ten per centum ad valorem on all merchandise that shall be imported in ships or vessels not of the United States.

—Gaston County, N. C., is the banner county of the State in the number of cotton spindles. Statistics, carefully compiled, show that the county has 105,426 spinning spindles, 6850 twister spindles and 2415 looms. The number of bales of cotton consumed during the year is 44,250, giving employment to 3365 employees, to whom is paid $563,120 in the course of a year. The amount of capital thus invested is $1,843,500, divided among 21 mills. The largest mill is the McAden, of McAdensville, which has been in operation since 1881. This mill has 13,000 spindles. Nine of the mills are without looms.

—Manufacturers do not resist the restoration of the wool duty. They affirmatively favor a reasonable duty on wool, as they have always done, because they believe in the policy of protection and are willing to make sacrifices in order that the policy may be applied to all products that need protection.—[North.

—It is a demonstrated fact that the wool manufacture suffered, in the tariff revision of 1894, a discrimination more marked and damaging than any other manufacturing industry.

—Whatever the farmer is suffering to-day is because his competitors have increased in number and his best customers are out of work.

COTTON DEPARTMENT.

Principles and Practice in Cotton Spinning.

W. SCOTT TAGGART.

In a series of articles written under the above title, an attempt will be made to present to the reader a review, as it were, of all that is new and important in connection with cotton spinning. The object will embrace details of construction; the principles underlying the operations for which they are intended; descriptions of operations as a whole, and their influence on the ultimate result in the making of yarn and cloth; and also a critical attitude will be taken in regard to much in cotton spinning which is at present passed over carelessly or in ignorance. To understand these objects a few words may be necessary in explanation, not because the objects mentioned are new, but rather because the method of treating them will be a departure from that usually adopted.

Unusual opportunities for observation in the cotton mills of Europe has led the writer to a conclusion that a remarkable degree of ignorance prevails among those in responsible positions, and even among those who are considered authorities upon the subject with which we are dealing. The ignorance is not so much a matter of want of practical knowledge as a lack of intelligent motive in what is done. This must be carefully borne in mind. We consider a man a good or bad workman according to the quality of the work he does, whether it lies in the realm of thought or action, or both combined.

Intelligence must not be confined to the object of the finished work only, but what is equally important, if not more so, is a perfect knowledge of the means adopted for attaining it. In this direction lies progress, invention, and the maintainance of superiority. A workman is all the better a workman if he knows his lathe and the mechanism of its action. A man discloses no intelligence by saying this machine is stronger or better than that one if he cannot also explain why. How often do men confine their opinions to mere statements of facts, or apparent facts, who are totally incapable of explaining them? We live now at a time when we must reason out our conclusions; we must have some real or probable cause for our decisions, if they are to have force or worth.

In spite of the fact that so much of our work is now of a sectional character, it is none the less real work, and there exists no reason, for instance, why a spinner tending the automatic action of his self actor should not understand its principles, not only of the machine as a whole, but of its individual parts. Natural aptitude will lead us aright in many cases and supply the requisite reasoning, but only acquired knowledge can give a completeness to it. The keynote, therefore, of future actions lies in the acquirement of knowledge of a kind suitable to the purposes of our intended work.

Writers who set out to analyze the working of cotton machinery, and to explain its principles, are held in check by the fact that their readers have not the requisite educational attainments to understand them. Indeed, writers in many cases have not the necessary knowledge themselves to give a correct explanation of details of the industry. If this is not so, how is it that our books on cotton spinning give erroneous explanations of such subjects as winding, cone drums, differential motions, the

quadrant, shaper and ring traveller? These are a few of many features that are of exceptional interest to the student as well as to the general reader. That such a method is necessary) and unfortunately it is absolutely necessary), is a deep reflection on our educational system, and also on the readers who have rendered such a method almost compulsory on those who desire to teach them. There is, however, growing up, a generation which, having the advantage of a good technical education, will be fully capable of understanding a reference to the principle and the natural advantages of formulae, and who will, in the absence of the almost childish system, still in vogue, feel themselves in a position to advance and improve the conditions under which they labor, having more time to devote to it and a good foundation of knowledge on which to build.

Teachers of cotton spinning classes in England (and no doubt it is the same in America), are compelled to resort to a most elementary way of teaching their subject. Three-quarters of the time given to a lecture is devoted to pure dictation, most of which is ordinary descriptive matter. When a calculation is necessary, the students are shown how to work it out in long multiplication and division sums. The rules are long statements of names of wheels to be multiplied together, or divided, and these the students are taught to commit to memory. It is no wonder that in many of our mills the carders, overlookers and managers look on the possession of rules applicable to the machine under their charge as valuable secrets, and not to their dearest friends would they disclose them.

All this must be altered, and scientific methods must be adopted, such as we find in other branches of science, and no doubt the new era which is opening before us the perfecting of a sound technical education will destroy the cumbersome and childish system of the present.

Our methods of work and machinery are now open to the world. Time is bringing about a greater equality in experience. We can only advance now by our ability to acquire knowledge and by putting it to a practical use. I know a firm who spent two or three years and a great amount of money in perfecting an invention, which, if they had had someone with an elementary knowledge of mathematics and practical geometry in their employ, would have beend one in one-twentieth of the time. A similar condition of affairs exists more or less in all industries, but in the textile industry we probably see it in its worst form. Even in our best books on cotton spinning we are told that the cone drums of the fly frames are parabolic in curvature and the writer evidently thinks the use of such a grand word is sufficient justification for using it, for not a word of explanation is given. Other writers attack the problem boldly and deduce a set of conditions which if put into practice would give a set of cones entirely opposite to the ones required. In one of our best works on cotton spinning much trouble has been taken to so explain the formation of the curves, and the unfortunate part of the business is that not one per cent. of the readers of it are capable of detecting the fallacy of the reasoning employed.

Another writer undertakes to explain the action of the copping motion of the mule. The large amount of practical knowledge displayed renders the book valuable; but as showing how little thought had to do with its production we need only mention that the curvature of the long part of the copping rail (a most important feature) is merely touched upon in one or two observations made as to its effect. If the writer had understood his subject he would have traced back the existence of that curve to its cause and not been satisfied with a mere statement of its presence. But here I may go further and state that, so far as my knowledge

of writers go, there is not one who has been in a position to explain this peculiar feature of the rail. One must understand the quadrant fully in order to find the solution, and to do this requires a little more knowledge than is provided by the ordinary elementary education. This lack of knowledge accounts for the fallacious explanation which disfigures one or two of our best books on cotton spinning. However, improvement is coming and students themselves are by their questions demanding something more than statements. As this continues we may rest assured that teachers will arise who will be capable of fully answering and satisfactorily instructing them.

Chalk Talks.

TO FIND THE WEIGHT OF GOODS.

This is a query which often proves a stumbling block to the student of weaving, not so much on account of the difficulty in solving the problem, as the variety of methods employed in the various manufacturing establishments. Here are a number of mills using methods of which it may be said no two are alike, and the fact that most of them are successful does not help the matter so far as the student is concerned. If he is at all thoughtful, the question of which is the correct method constantly forces itself upon his mind. To all such the question resolves itself into one of conditions (many of the rules in mill work are largely approximate, and the conclusion which can be safely arrived at is that no matter what the rule or method adopted, if figured from a correct basis, there cannot be much difference in the results obtained,

In a previous article rules were given to find the average number and the counts of yarn required to produce the same. At this time there will be presented one of the methods in use when calculating the yards per pound.

As many weavers are aware, there is a certain amount of contraction in the length of warp yarn after being converted into cloth. If the length of a cut at the slasher be 60 yards, the yarn when woven will be something less than 60 yards. The amount of shrinkage will vary according to the yarns used and the intersections per inch in the fabric, *i. e.*, the number of times the warp threads have been passed over and under the filling threads. Hence the warp shrinkage in a 40-pick cloth will be less than in one of 80 picks, using the same yarns. On the same principle a 2-2 twill cloth will yield a smaller percentage of warp contraction than a plain cloth, the same being equally true of a 5-harness satin weave. When the intersections are less in number the threads are not bent out of a straight line in the same degree, and a greater length results.

In medium counts and yarns, when used in the production of plain cloths, it has been found by experience that a length of 55½ yards at the slasher will produce a cut of 52 yards cloth, and the calculations here given will be upon that basis.

By multiplying the total number of threads in the warp by 55½, and dividing by the number of yards in one hank (840), the number of hanks is obtained, and this divided by the counts of warp gives the weight of warp yarn inclusive of the amount of size. In mills where the sizing is for weaving purposes rather than weighting goods, the quantity may be estimated at from 5 to 8%.

The weight of filling may be found by multiplying the width in the reed by the picks per inch and 52, dividing by 840 for hanks, and again by the counts of filling for weight.

EXAMPLE: How many yards per pound are there in a fabric whose construction is as follows: 48 sley, 44 picks, 36 inches wide, 30s warp, 40s filling?

$1755 \times 55\frac{1}{2} = 97236 \div 840 = 115.75$ hanks
$\div 30 = 3.85$, weight of warp.

$38.25 \times 44 = 875.16 \div 840 = 104.18$

To find the weight of goods

Example:- How many yards per pound are there in a fabric 36 ins wide, 30's warp, 40s filling?

48 × 36 + 24 for selvage = 1752 threads in warp.

1752
55½
8760
8760
876

840) 97236 (115.75 hanks
840
1323
840
4836
4200
6360
5880
4800

30) 115.75 (3.85 nt of warp
90
257
240
185

3.85 nt of warp
.26 7% size
2.60 filling
6.71) 52.00 (7.75
4697
5030
4697
3330

1752
.066
10512
10512
115.632 hanks

38.25
44
15300
15300
1683.00
52
3366
8415

840) 87516 (104.18 hanks
840
3516
3360
1560
840
7200

40) 104.18 (2.60 nt of filling
80
241
240
18

7.75 yards per lb.

or

30) 115.638 (3.85 nt of warp
90
256
240
163

(hanks)÷40=2.60, weight of filling.

52÷6.71 [3.85 (warp)+.26 (7% size) +2.6 (filling)] = 7.75 yards per pound.

The calculation may be shortened by finding constant numbers which will answer for any construction, thus: 0.66 becomes the warp constant. This being the decimal part of one hank contained in one thread 55⅓ yards long. Taking the same calculation it will be as follows:

1752 × .066=115.632 (hanks) ÷ 30= 3.85, weight of warp.

Many of the figures are thus dispensed with, and the weight can be worked out more rapidly than by the ordinary method, and although it is approximate, like all other rules when dealing with a varying quantity, still the writer has found the method extremely useful when called upon to make rapid calculations. Students of weaving and those interested along this line will find, by a little thought and some experiments, that the part of the calculation relating to the weight of filling may be simplified and reduced so as not to occupy any more space than the one given to find weight of warp.

TEXTILE.

Bad Yarn and Their Causes.

BY M. M. BUCKLEY.

There is probably no question of greater or more vital importance to the spinner than the character and suitability of the yarns he produces for the specific purpose for which they are to be used. His supreme object is to obtain a thread that is regular, elastic, and of uniform strength throughout. This is his ideal, but in practice he finds himself confronted with a variety of causes, which constantly militate against its attainment. This occurs not at any particular stage, but at every operation, only the effects become much more apparent, as we approach nearer to the process of spinning where the formation of the thread is effected. Frequently these contrary causes are easily detected, but there are often others which are unavoidable.

Here we might profitably define what a thread is, in the simplest sense of the term, so that we can more readily comprehend how and by what it may be influenced. It is essentially a ribbon of fibres which may be definitely arranged or otherwise caused to assume a round form by being twisted upon its own axis and subsequently wound on to a bobbin of some special form, or may be arranged in a definite shape upon the bare spindle.

Now, let us inquire what the requirements are which an ideal thread involves. Absolute regularity implies first that the component fibres themselves must be perfectly regular; and second, there must also be exactly the same number of individual fibres present in the thread at every point. Further than this they must also be all of the same length. Since, however, this rigid uniformity in the raw material is never obtainable, this, together with our inability to secure an even distribution which are more or less beyond our control. The extent of the irregularity arising from this latter factor is, in a very great measure, dependent upon the methods adopted in the preparatory stages of manufacture and the character of the machinery employed. Though it is alway present, we find it more pronounced in some cases than in others. If we are to approach, even approximately, to an equal distribution of the raw material, the initiatory step must be taken at the earliest opportunity.

The first machine, if possible, should be used for this purpose, and since, generally, a feed device is necessary, use is made of this to spread a certain weight of the material over a given space. The methods adopted for accomplishing this are to a certain extent debatable, some holding that, in order to neutralize as much as possible the

influence of atmospheric conditions, a certain quantity of the raw material should be used as a counterpoise weight, while others maintain that a fixed weight is the most advisable. In the first instance, it must be borne in mind that if the raw material be used as the determining agent, its weight will be a constantly fluctuating factor; and further, since only as limited quantity can be used as a counterpoise, it will respond more readily to changes than will the bulk from which the weighings are being taken. Again, if carefully weighted in the early morning when the machinery is started and then compared with the same quantity taken from the bulk, they will probably agree. Leave the balance alone, with the weights on, then after the counterpoise has been in use some few hours take it and weigh again, and a manifest difference will be observed. Now take from the bulk again and weigh, and compare this with the previous result and there will be, generally speaking, very little if any difference. This shows then that the counterpoise itself is the most readily affected, and out of a large number of experiments and comparisons, I have invariably found this to be the case—that the smaller quantity is more readily influenced than a larger one. This, therefore, indicates that the counterpoise of the same material is not so suitable as at first sight it appears.

To be continued.

Weaving as a Fine Art.

Paper of ALFRED HAWKESWORTH, Montreal, Canada, read before New England Cotton Manufacturers' Association, April 2d, 1897.

No particular piece of cotton, or even any other kind of goods, can be made so that it will suit every requirement, and we should therefore study the use to which particular goods are to be put, and so build them that they will be the best for such purpose made.

Yarns of the proper size and sleys to match with some degree of proportion and twist should be employed when we wish for the best effects. For instance, a No. 28 warp yarn, regular twist, should not be used with a No. 14 weft hosiery twist. The goods would be flimsy and soft, but far from artistic in appearance. If it is desirable to use a coarse weft with a fine warp, the twist of the weft should be more than ordinary square of No. $\times$ 325. The sley of warp should be higher than the number of picks per inch of the weft. The above formula will give a degree of quality in looks that the softer weft will destroy, particularly if the sley of the warp is lower than the picks per inch of weft. To weave fine warp yarns artistically in sleys as high as 80 or more, using very much coarser weft, the twist of the warp should be as high as the quality of the cotton used will permit, and in goods made after this formula superior cotton should be used, so that the elasticity of the warp yarns will assist the beating of the weft into place without causing those breakages that will otherwise entirely destroy the smooth effect in the goods.

In plain cloths a fine weft combines nicely with a coarse warp if the difference is not too great. A coarse weft, with care, can be used with good effect in a fine warp. Square goods can be made very presentable where sley and picks are in proportion to the size of the yarns.

The goods used and sold by the general trade or what may be termed the "counter trade" form the greater part of what are used by the housekeeper for all her wants, and it is of this class that most can be said. In building goods of the class named, warp yarns as coarse as No. 20 can be used for brown fabrics, and this number should form an important part of the warp, while the weft should not vary more than 4 to 8 numbers coarser or finer, according to the number of picks of weft required, which, together with the sley, will determine the weight and price per yard. In weaving any class of goods, either

in the plain, twill or fancy, great care must be taken to have the warp beam wound true upon the slasher, and that the gudgeons are central with the barrel of the beam, so that they will unwind perfectly true. The whip-roll and breast beam must be square with the warp beam and rigid. The reed also must be true with all these and held in a rigid lay that also must present a parallel line to the whip-roll and warp beam.

The size of wire in reeds and the depth between boke or ribs will make or mar the artistic appearances of the best woven cloths that are to be used for any purpose, in a brown state more particularly, and will have a proportionate influence when they are to be finished. Reeds made from wire as fine as No. 18 to No. 20 for fine yarns in high sleys should not be more than 2 5-8 to 2 3-4 inches between the ribs. The shorter sweep of looms made expressly for fine weaving will allow a smaller shuttle and smaller sheds, and hence a shallower reed. The action of the shuttle in rubbing against the reed will cause the threads to oscillate and zig-zag so that the cloth will never get back in finish their proper appearance, and in the brown state will be far from artistic. We require in all reeds wire to be stiff enough when held in a good boke not to spring as the shuttle rubs against it in passing from one box to another. We always require the wire in reeds to be as strong and fine as will resist the beat or force of making the fabric, and that we may get all the room for yarn possible. Reeds for general work should never be made more than three inches between the ribs, unless for long sweep looms, and then the size of the shed should determine the depth.

The print cloth reed should be but 2 3-4 inches between the ribs, and wire not coarser than No. 15 to 15 1-2. The reed draft for ordinary plain goods is generally two threads in one dent. When yarns are fine and sleys are open, they should be drawn with only one in each dent. This will give a much more artistic piece of cloth, and cause no more breakage unless yarns are quite coarse. This idea should be carried as far as possible on sleyed goods where appearance is desired in brown goods.

The hard twisted cottons will not dye in such perfect colors as those made more soft; neither will the extremely soft sent the printers, as will the slightly harder, so that a knowledge of what a cotton is to be used for is indispensable to the proper and most satisfactory formula for building it.

To give cover and a soft feel to the cloth in a brown state, and when cover is not desired, but an even tension of each division of the warp, and to assist in laying the picks of the weft in the most artistic manner possible, the master weaver must so arrange his loom that the movements of the sheds or the divisions of his warp will be equal. The changes of the sheds must take place at about five-eighths of the swing of the lay (if such swing be 4 1-2), then 5-8 of 4 1-2=2 13-16, which taken from 4 1-2 will leave 1 11-16 inches. This should be the point or distance from the fell of the weaving cloth, where all changes should start from. Where cover is not desired, a straight line drawn from whip-roll to breast beam will be the position to arrange these two very important parts of the loom without reference to the lay. Where cover is desired, the yarn in weaving must be slightly tighter on the bottom half of the warp than it is on the upper half. This can be brought about by raising the whip-roll or breast beam, or both, so that the lower half, when the picks are beaten to place, will be depressed one-half of the swing of the lay, or about 2 1-4 inches when a straight line is drawn from the whip-roll to breast beam, and measured down to the race of the lay when it is resting in the centre of its swing. These figures can be varied as the weaves are light or

heavy, bnt it will always be found of assistance in giving a good appearance to the cloth.

Of course where no cover is wanted, but more even tension of sheds are re-required to prevent stretching, the proper position will be found in the centre of the lay swing that is to make all changes. Yarn stretching is of more importance in certain classes of goods than might appear to the inexperienced, but it is an error that creeps into nearly all classes of weaving, light, as well as heavy goods. We find in coming into our cloth from a number of causes, chief of which is a defective sand or cloth roller, sometimes made so by a mistaken idea of the loom-fixer, or even overseer, that his selvages will weave better if he adds an extra thickness to each end of the cloth roller.

Colored Goods in the Dressing Room.

Continued from March.

When the chains are returned from the dye house, each one has its own warping ticket, showing style, pattern number, etc. The beamer fastens this ticket to the yarn when the warp is beamed. In addition to the ticket, it is a good plan to mark the yarn on the beam with a suitable color of chalk, the style and pattern; as by doing so any trouble is saved in case the ticket gets misplaced.

The re-beaming frame is a simple machine, but considerable difference can be made in the way the work runs, by humoring the work in regard to the amount of drag used. The distance of the drag rolls from the beam should be, on ordinary work, sixteen to eighteen feet, as with too short a stretch the yarn does not get a proper chance to open well, while if the stretch is too long, it is necessary to run more drag than is good for the work. If the warp does not have a pretty hard drag, on a long stretch, it sways and sags too much.

It is a great thing to have well-trained, faithful help in the beaming room, as careless beamers mean crossed threads, lost ends, bad knots, ends twisted instead of being tied, etc. It takes considerable time to make a first-class beamer, so they are expen sive help to change. There is quite a temptation to run girls instead of men beamers, because the girls will work for smaller wages, and they are also, as a rule, less troublesome to manage. On heavy work that does not run very well, men are generally the cheapest, even at higher wages, as they can stand up to the work better.

In some beaming rooms the help are practically all paid by piece work, so much a lease or thousand yards, while in other rooms the beamers are all paid by the day. On the piece work system, paying say twenty cents a thousand yards, if the work runs well the help can make good wages; but warps poorly handled in the dye house raise Cain with the beamer's product. Paying day wages makes it easier to obtain good work than the piece work system, because practically all the temptation to slight the work, in order to get it through quickly, is removed; and taking one thing with another, day pay is as cheap as piece work.

With slack and twisted selvages, snarls, smashes and lost threads which prevail to a more or less extent in every mill in this country, the beamers have considerable bad work to make go, and when running some colors which have to be handled a good deal in the dye house, the cost of beaming is bound to go up.

As an example of this, at one time, several dark blue warps required twenty-one runs each in the dye box to finish them, and many of them took as much as three and a half and four days to beam, while light colored warps of the same length took from nine to eleven hours to run. On a general average, the cost of these dark blues was more than double what it cost to beam the lighter colors.

After beaming, the section beams are ready to be taken to the slashers. The slasher tenters require a picking-in ticket as a guide to putting the yarn on the comb in the order called for by the pattern. In making out the pattern it is necessary to consider the width of the beam and the number of ends. Better results are generally obtained by running five ends in a split, rather than eight ends, and opening out the comb to give the required width.

In some mills, instead of running 24 ends of white, for instance, on a pattern beam, a temporary creel is put behind the slasher creel, and twenty-four spools of yarn run on it. Otherwise 24 ends can be split off a stock warp and run on a pattern beam; in this case, with 156 ends gray and 24 ends red.

Upon the slashers there is a great deal of responsibility, so much does the product of the weave room depend upon the way the warps are dressed. To successfully run colored pattern work, requires steady, competent slasher tenters, suitable sizing mixtures and men in charge who thoroughly understand their business. In addition to the slasher tenter's general duties, which are much the same as on white work, he must be on the alert to keep his tie-backs as low as possible and keep the pattern straight on the comb. The number of tie-backs depends a good deal upon the way the work is handled. I have seen them run eight and nine per hundred cuts a day, and had them run as low as one and a half per hundred cuts a day. It isn't fair to blame the slasher for all tie-backs, for most of them belong on the warping and beaming.

On some classes of goods, a double sow box is used, the dark colored ones that are troublesome, on account of bleeding, being run in one box, and the white or light colored yarn in the other. This, at the best, is an inconvenient way, and in a good many cases used unnecessarily, as a suitable sizing compound will stop trouble from bleeding. For example, on a red and white ticking, which was formerly run, it was absolutely necessary to run the work in a double sow box, but after using a sizing compound which was recommended for the express purpose, all trouble from the bleeding stopped, and both colors were run in one box.

PICKER.

Cotton Manufacturers' Association.

According to the excellent authority of Colonel Samuel Webber, Charlestown, N. H., the scheme for an association of cotton manufacturers was originated in 1854, by Jones F. Davis, agent of the Lyman Mills, Holyoke, Mass., at a time when the necessities of such an association seemed to impress themselves upon a number of manufacturers. It was at a time of general improvement and change in cotton machinery. The railway-head and evener, and also the improved temple and shuttle guard were being introduced by George Draper, the Kitson opener was just coming out, the slasher was being discussed, the speed of shafting was being increased, and altogether there were many other things being talked about. An association of this kind was started, without a charter, however, and was known as the Hampden County Cotton Manufacturers' Association, which met two or three times a year in an informal manner, until the great financial crash of 1857. The matter was not again taken up until 1865, when Mr. Davis again proposed the carrying out of his idea of the old association. Governor Straw, of New Hampshire, became interested in it, and a preliminary meeting took place at Young's Hotel, Boston, April 20, 1865. A more formal meeting was then planned, which occurred July 19, 1865, at which there was a goodly attendance of cotton manufacturers. The organization was then established with E. A. Straw for president. From that time the association grew to its present importance.

WOOLEN DEPARTMENT.

Mathematics in Textile Work.

THOMAS R. ASHENHURST.

A fair knowledge of mathematics is of more importance to those engaged in textile manufactures than is generally supposed. Apart from the value of such a knowledge as developing the reasoning powers, there are occasions where accurate results must be obtained when it becomes absolutely necessary, and at all times it will be of material assistance and often effect great saving of time or material, or both. A very brief glance at the application of some of the less known principles or rules of mathematics, or at least, those not generally studied, will demonstrate this. For instance, in mixing or blending wool, cotton or other materials, the law of averages must be applied, not only for determining the value of a known mixture, but for determining the relative quantities required to produce a mixture of a given value, or the actual quantities required to produce a given bulk and preserving at the same time the relative quantities of each.

In twisting threads together, the doctrine of combinations comes into use, for not only must the actual count of the compound thread be determined, but, if the two or more threads are of different value or cost, the cost of the compound yarn must be determined. Again in determining the twist, or turns per inch in yarn, the relative bulk or sectional area must be taken into account, thus compelling the use of the square root, for threads are like all cylinders or twisted bodies, and the number of turns or twists per inch must be increased, as the diameter is decreased if those twists are to bear a corresponding ratio to the diameter.

In twisting two threads together there is a certain amount of "take-up" in the length of yarn which will vary according to the diameter of the threads twisted and according to the number of turns per inch in the twist.

In building a fabric, it is necessary to find the number of threads per inch of any known count of yarn; also the degree of compression to which a yarn is, or may be subjected, to produce a required result, and what relation this will bear to the specific gravity of the fibre, and many other points which I will endeavor to illustrate and elucidate. I will begin with the raw material and pass forward through the various stages of manufacture so as to show fully and clearly the desirability of the knowledge I have suggested.

The subject of blending raw materials naturally comes first in order; then the law of averages must first be dealt with. To make the matter as clear as possible, suppose there are two materials of different value to be mixed. The mixture must contain an equal quantity of each, then the actual value of the mixture must be found, which is really the average value of the two. Say one costs 20 cents per pound and the other costs 16 cents per pound; then 1 pound at 20 cents + 1 pound at 16 cents = 2 pounds for 36 cents, or $\frac{36}{2} = 18$ cents per pound the value of the mixture. This is simple and easy enough as it is also when both quantities and values vary. Suppose that instead of mixing the two materials in equal quantities it is desired to mix them in unequal quantities, using a larger proportion of either the lower or higher value, as for example, 8 parts at 20 cents and 6 parts at 16 cents; then there would be $8 \times 20 =$

160, and $6\times16=96$. The sum of the two weights would be $8+6=14$. The sum of the two costs 160c. + 96c.= 256c. so that 14 parts for 256c.$=\frac{256}{14}=18\frac{4}{7}$c. the average value. If there are more than two materials, the same rule must of necessity apply, for by adding the sum of the parts and the sum of the costs together and dividing the latter by the former the average must be found. So far, the finding of the average cost of the number of particles of different values is very simple, but it often happens that the average or resulting value of a compound must be varied or lowered, or, that the constituent parts must be mixed in such pro portions that a given resulting value be obtained. For instance, the two materials just dealt with when combined in equal quantities produce a mixture worth $18\frac{4}{7}$c., but it may be desired that this value be either raised or lowered, which would mean an increased quantity of one of the two materials, and that in an exact ratio to the alteration in value. Suppose the value of the mixture is fixed at 17c., then the relative quantities of the two would be 3 parts at 16, and 1 part at 20 cents. If on the other hand the resulting value must be 19 cents, then there would be 1 part at 16 and 3 parts at 20. To prove this, 3 parts at 16=48, 1 part at 20=20,

$$\frac{48+20}{4}=\frac{68}{4}=17;$$

and 3 parts at 20=60, 1 part at 16= 16 and

$$\frac{60+16}{4}=\frac{76}{4}=19$$

The simplest way of expressing this, or working it out, is to place the given values under each other, with the desired average to the left, then place the difference between each value and the average, thus:

$$19\left\{\begin{matrix}20\\16\end{matrix}\right.$$

Link the values together, on the right, and place the difference between each value and the average opposite that to which it is linked, thus:

$$19\left\{\begin{matrix}20\,|\,3\\16\,|\,1\end{matrix}\right.$$

and those numbers represent the relative quantities required of each material.

When three or more values are combined, there is more room for varying the relative quantities and yet keeping the desired average. Suppose, for instance, there are three of the values of 20, 16 and 12, respectively. The combined value may be anywhere between 20 and 12, but as it falls below or rises above 16, there will be an increased quantity of the 12 or 20. Suppose the combined value to be 14, thus:

$$14\left\{\begin{matrix}20\,|\,2\\16\,|\,2\\12\,|\,6+2=8\end{matrix}\right.$$

And

$$\begin{matrix}2\times20=40\\2\times16=32\\8\times12=96\\\hline 12\qquad 168\end{matrix}$$

And

$$\frac{168}{12}=14$$

So that there would be, as shown, 2 parts at 20, 2 at 16 and 8 at 12. On the other hand, if the value should be fixed at 18, there would be two at 12, 2 at 16 and 8 at 20.

The rule is practically self-evident, for the higher value must neutralize the lower, and *vice versa*, and that in the exact ratio of the difference between them and the desired value. If the number of values be increased, greater variations may be made, and when the desired value lies between the two medium values, then an increase may be made of either the highest or lowest, at will.

Suppose there are four: 24, 20, 16 and 12, and the average is fixed at 19. Then

$$19\left\{\begin{matrix}24\,|\,3\\20\,|\,7\\16\,|\,5\\12\,|\,1\end{matrix}\right.\quad\text{or}\quad 19\left\{\begin{matrix}24\,|\,7\\20\,|\,3\\16\,|\,1\\12\,|\,5\end{matrix}\right.$$

This shows that not only may the relative positions of the two extremes be reversed, but their positions are re-

versed in relation to the two intermediate values.

A complete knowledge of this is of importance to all those engaged in any industry. A mixture of materials is of every-day occurrence, because it not only enables the blender to arrive at the correct value at once, but, what is quite as important, to determine which grade of stock shall predominate. If he is working for high class material, he will employ the largest quantity of the best stock; if for medium, probably the most of the medium stock; and if for low grade goods, the largest quantity of the lower priced, the others being used to give tone or quality.

The application of the law of averages does not end here. There are cases where it is desired to use up a certain quantity of one of the materials, and it is necessary to find how much of each of the others will be required and maintain the same balance. Suppose that 500 pounds at 20 cents are in stock, and either of the above proportions has been decided upon. Then it is required to know exactly how many pounds of the other three values must be purchased or provided.

Here again it is simply a question of proportions producing an average. In the first combination, where the average value is 19, the number of parts at 20 are 7; the others are 3, 5 and 1, respectively; therefore, as there are 500 pounds at 20, there must be less of each of the others required to go with it. Then the ratio wi l be as 7 is to each of the others in succession. Thus:

500	at 20
7 : 3 : : 500 : $214\frac{2}{7}$	at 24
7 : 5 : : 500 : $357\frac{1}{7}$	at 16
7 : 1 : : 500 : $71\frac{3}{7}$	at 12
$1142\frac{6}{7}$	

To prove the truth of this, multiply the weight of each by its cost, thus:

$500 \times 20 =$	10,000
$214\frac{2}{7} \times 24 =$	$5142\frac{6}{7}$
$357\frac{1}{7} \times 16 =$	$5714\frac{2}{7}$
$71\frac{3}{7} \times 12 =$	$857\frac{1}{7}$
	$21,714\frac{2}{7}$

Thus, the total weight is $1142\frac{6}{7}$ and total cost $21,714\frac{2}{7}$, and

$$\frac{21,714\frac{2}{7}}{1142\frac{6}{7}} = 19, \text{ the average.}$$

(To be continued.)

Back Finishing.

There is a very common class of fabrics now upon the market which differs almost entirely from the fabrics of former days, in the fact that it is necessary to put as much finish on the back of the goods as on the face. Much used for various kinds of outside wearing apparel, they are a tasty and a taking cloth, and in order that the finisher may get an item or two of interest on the subject, we would like to give some personal experience.

One of the greatest differences lies in the amount of care required in the finishing processes. When we had only to look at one side of the cloth, we naturally got into the habit of being quite cautious regarding the face of the goods, but very careless regarding the back. Here we must, in all our handling, remember that one side is quite as important as the other. At the very beginning the specking, burling and mending impresses this fact upon us. We must see to it that ends sewn in, runners removed and all the changes that take place in these processes are so manipulated that they do not injure the back of the cloth. It will require no small amount of special attention to keep all colors and all fancy threads in their correct positions, both on face and back. But this is what must be done if the work is to be a success.

When we come to the fulling mill, about the first thing we think of is the calculation for the length to which the goods must be fulled. In figuring this calculation, we base the whole process upon a percentage of loss which the cloth sustains in finishing. Well, since our cloth is to be finished on both sides, the proportion of loss will be much greater in this case, and a proper allowance must be made for it. The

gigging is one of the most active processes on the fibres of the cloth, and if the back is gigged as well as the face, the loss from this source will be nearly doubled. We also calculate the flocks, too, at the same time that we do for finished length, and this calculation will be very different, since the extra work on the back of the goods will wear away that much more of the flocks. Suppose we figure that it will require two pounds of flocks to stay in the goods in order that they shall finish the correct weight per yard. In this case, as ordinarily, where the face only is finished, we would add, say, about four pounds in the fulling, being assured that about half of that amount would stay on the cloth. But if the finish is to be on the back, too, then it will take at least six pounds additional, and then perhaps even the two pounds may not endure throughout the processes. In some kinds of cloth it may be necessary to put on four times the weight of flocks that it is wished to make up. Flocking becomes quite an item, and where such a quantity is to be used, unless most diligent care and judgment are used in its selection, the shades will be materially altered. This is the great thing to be kept in mind. When no flocks are used the ordinary process is used, and the only difference is in the percentage at which the goods are calculated. The same soap as to quantity and quality will answer, and under ordinary circumstances the same length of time will be required. It may be necessary to tack the goods, selvage to selvage, or it may not, according as we use flocks or not, and according to the color conditions of face, back and flocks. With these few exceptions, the process of fulling is quite what it is in the ordinary kinds of woolen fabrics.

The next process, where any difference of detail is perceptible, is the gigging. The scouring and fuller's earth treatment are regular and normal, but the gigging will naturally vary somewhat from that required on the merely face-finished cloth. After the fuller's earth treatment, the goods are stretched out on a roller and laid for 12 hours; then we proceed with the gigging. The back is first treated. The gigging will necessarily have to be pretty gradually done, and it will be absolutely imperative to use none but the oldest and softest work at the beginning. The work is advanced to sharper grades, six slats at a time, very gradually, until at last we can safely employ sharp work. The back gigging must raise up the fibres pretty well from the bottom. It must loosen them down to the body of the goods, and leave the colors and design distinct and clear. Once the back is in the right kind of shape, we begin with the face, and of course the same amount of care will be required here, too, to keep from weakening the cloth by too much work. However, it is not necessary to go quite so gradually as in the case of the back. The face is usually intended for a close finish, and its construction is such that a more vigorous kind of work can be done than on the back, yet it is always in order to take all precautions possible so that none of the fibres may be dragged out. It is evident that the loosening of the back fibres must have some effect on the body of the cloth, and once the back has been gigged, it is plain that the gigging of the face will have more opportunity to pull out fibres from the cloth than it would have had if the back had been left intact.

Burr-dye, next; then rinse, extract and brush. This is about the order that must follow, and the processes are very much what they are in ordinary finishing of woolen fabrics. Whatever treatment the face receives in these larger and more important processes, the back must get too. After the brushing comes the drying, and the drying is followed by another careful inspection, as burling and mending. A second run on the brush with steam now takes place on both face and back, and we

have the cloth ready for the next great process, the shearing.

As in the gigging, so in shearing, we handle the back of the goods first. The back is never a close finish, and as a usual thing we give it several runs and leave it with a little of the nap upon it. This makes a good wearing foundation, and furnishes an even and uniform basis on which the finishing shearing can be done. It is quite likely that the face nap will need raising on the raising machine, in order that the shear blade can get down closer to the body and clear out the surface. The speckers take another look at the cloth, now, and a brushing on both sides with a little steam softens and renders the cloth ready for final examination. As would be expected, two examinations are necessary before the goods can be passed, and then a brushing again puts them ready for the press and for the other final processes, which ensue before the goods are ready for the market.

It is quite plain that in these last stages of the finishing, the very best of care is required to keep back and face both perfectly free from all harsh handling and rough usage; and if the proper precautions are taken, both surfaces should finish up in attractive and perfect style. —MANUFACTURER.

Card Room Topics.

Through an extensive experience of 25 years in the woolen business, it has been my privilege to notice many irregularities in the preparation of stock and the process of carding. I venture, therefore, to give to the readers of your magazine the result of my observations in this line, hoping they may be of benefit to someone. It is a well known fact to all good carders that stock must be prepared properly before reaching their department, otherwise their best endeavors will result in failure to produce good roving, yarn or cloth. We should always start at the beginning by having the wool properly sorted and scoured. As a rule, not enough attention is paid to preparatory processes. The stock is rushed through most any way to favor quantity rather than quality, which method is detrimental to good work all through the after processes. If the scouring liquor is too hot it is liable to set the animal grease in the wool, causing trouble in the dyeing, carding and finishing processes. Again, if the scouring liquor be charged with too much alkali, the fibre becomes harsh and broken. Just sufficient heat and scouring material should be used to start the grease thoroughly and leave the wool clean, soft and lofty. The wool should be rinsed well. Oftentimes stock is injured in dyeing by too much boiling, and in the use of acids, etc., burning the fibre so as to cause it to become brittle and rotten, resulting in poor work all through. Another source of bad carding is in the manner of preparation in the picker room. I have seen good stock ruined in this department many times. Old worn-out pickers, seldom cleaned, fed by boys, or men no better, seems to be the rule in many mills. Now good work from such preparation as this is impossible. The best pickers to be had are none too good, especially burr pickers, for when the burr cylinders are not in good condition they are liable to cut the stock and roll it up. Good machinery and good men will soon pay for themselves in this department. The greatest attention should be paid to mixing stock, especially on making mixes, or when combining stock such as low substitutes with wool. If we mix long, coarse stock with short, fine stock, the short stock will drop out in the carding process and make uneven work. Color mixes should be made in layers evenly distributed and picked sufficiently to mix thoroughly.

There is another process about which I wish to say a few words before closing this article, and that is grinding. It is my opinion that carders are apt to err in too much grinding rather than

too little. It has been my experience to notice where incessant grinding was the rule there was always bad work, and the best work I have seen coming from cards, both as to quantity and quality, was where the cards had not been ground for over seven months, at the time I saw this room, and they were running on various sizes of yarn and mixes from two to six runs, and better roving or better spinning the writer has never seen. This fact speaks in favor of less grinding. I have also seen good yarn in coarse counts made on cards not ground for two years, which goes to show that the incessant grinders are in error in their views. Too much grinding results in wearing out the clothing and creates a hook point on the wire, breaking and mutilating the stock instead of carding it, which must result in bad spinning, weaving and bad work all along the line. —EXPERIENCE.

A Southern Carpet Industry.

L. J. HEATWOLE.

Carpets originally came into use among people of the Orient; first for spreading upon the ground in the various parts of a tent, or of other temporary dwelling places, and second, for covering the floors of temples and palaces. At the supper of Iphicrates, who flourished in the earlier half of the fourth century, B. C., purple carpets were spread upon the floors; and at the great banquet given by Ptolemy Philadelphus, it is stated that underneath the cushions "were strewed purple carpets of the finest wool," the pattern of which was alike on both sides.

Oriental carpets first appeared in Spain, in the time of the Moors, and later were introduced into Italy by the Venetians; but carpet manufacture does not appear to have been resorted to in any part of Europe, before the beginning of the seventeenth century. In 1664, the carpet factory of Beauvais was established in France, which has since become famous for the great variety and artistic quality of its productions. In the year 1851, there were specimens exhibited in London, of Beauvais manufacture, in Turkish, Peruvian and Chinese styles.

Carpets that are manufactured at the present day, as a rule, may be classified under two general heads: Such as are produced after the Ancient method, as tying and knotting into the warp, tufts of the material of which they are made; and those in which the figure of the pattern is brought out through the ordinary process of weaving.

One purpose of this article is to treat of a species of carpet manufacture as practiced in connection with the domestic life in certain parts of the United States. For the past fifty years, this industry has been common with the German class of people in the South and West, where, on account of the readiness with which the material is procured and the greatly improved facilities for dyeing and weaving, a fabric is being produced that, with upholsterers and for furnishing houses, forms quite an article of trade.

The warp of this home-made fabric consists of No. 8, 3 or 4-ply, untwisted, cotton yarn, though in some cases the warp is an article known in the market as "prepared chain," which is slightly twisted. In the warping, various colors, such as red, blue, yellow and green, are striped in upon a ground of black or brown.

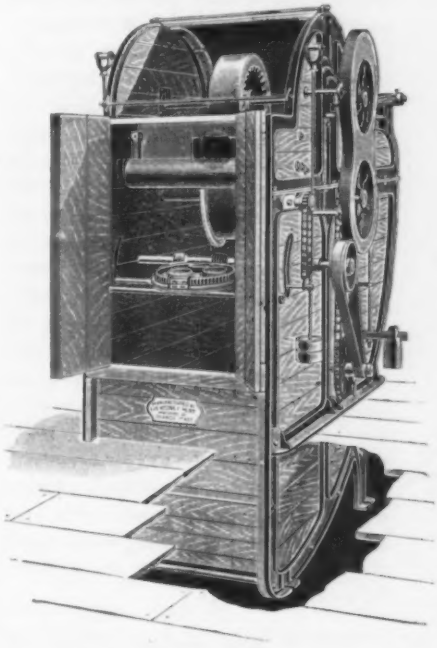
In weaving, brightly colored bands of cotton or worsted, evenly cut and trimmed to the width of about three-quarters of an inch, are substituted for the weft. The transverse adaptation of colors produces to the eye a most marvelous and happy effect.

This style of carpet manufacture, though originally practiced by the German housewife only, has led to the establishment of a staple article in some parts of this country, that, in the light of its durability and handsomely executed designs, is, in a great measure,

taking the place of the more luxurious and costly carpets. Local factories have, in late years, been started at various points in Virginia, and in several other States, to meet the growing demand for this particular line of household supplies. In connection with this industry, many mothers and daughters of the South, are finding employment in their homes, by cutting and preparing from cast-off clothes, the stripes used for carpet weaving. These, after being dyed, trimmed and wound into one-pound balls, are put up in sacks and turned over to the weavers.

Rotary Fulling Mill.

The importance of a properly constructed fulling mill for the finishing of woolen fabrics requiring felting, is too well known for comment on our part. The Rodney Hunt Machine Co., Orange, Mass., have long been most favorably known for the care which they exercise in the selection of the material that they put into their machinery, and for the workmanship thereof. As builders of machinery for wet finishing, their name stands among the foremost in the introduction of many important improvements in the way of specialties that have come universally into high favor with manufacturers. One of their most important specialties may be mentioned, their new rotary fulling mill, herewith illustrated, specially designed and adapted for the Balbian patent system of fulling, the essential and important improvement of which being the revolving guide rings through which the goods are drawn by the main squeezing rolls. These rings are made of brass and are bolted to the cogged disk, which is kept revolving, and each string of cloth is constantly turning and changing position from side to side, preventing wrinkles and streaks, and the goods are fulled exactly alike and felted evenly and with better felt. The soap is applied more evenly, and all cloudy effects are prevented, and needs no attention after the soap is on the piece until finished. All pieces finished alike and at the same time. The slow movement of the revolving rings keeps the goods open and they do not catch up or become twisted. A simple and reliable stop-motion arrangement is secured in connection with the ring device, which stops the mill instantly in case of knotting, although knotting of the goods is almost wholly prevented by the revolving rings. The form and capacity of the mill are especially de-



signed for the best results from the revolving ring, although the use of the rings in fulling mills not made especially for them, will be found very satisfactory, fulling in from 20 to 40 per cent. less time than without them, according to the kind and form of the mill. A single set for three strings, like the cut, can be used, or a double set for six strings, as desired. Their improved crimping box for fulling in length, can be controlled and retained at any desired pressure. The main squeeze rolls have cast iron centres

which can be covered with wood, presenting grain ends to the cloth, or they may be covered with brass, or rubber, as desired. The rolls have side flanges of brass usually, although the plain wide faced rolls are often preferred. The wood faced rolls have each piece of wood firmly keyed and a circular collar covering ends of keys on side of roll. They provide any style of mouthpiece desired for conducting the cloth to the rolls. The cut represents mouthpiece made of wood and arranged to adjust from outside of mill, and conform capacity to weight of goods and number of strings. They also furnish the adjustable, upright rolls, made of Lignum-Vitae, or of finished cast iron, plain or fluted, and they have patterns for various other methods. The mill frame is made of cast iron and the casings of best Georgia hard pine, and like all of their machines, every part is made in the most thorough manner. The location of side flanges for supporting mill on the floor, may be varied up or down, and front doors made with more or less opening. Friction clutch or tight and loose diriving pulleys pro vided as preferred. Stretching attachments and other devices for special work provided when desired. These mills are made in two sizes. No. 1 is three feet wide for three strings, and No. 2 is four feet wide for six strings, between the casings.

Wool Sorting.

SANITARY PROVISIONS.

The English government, under the recently enacted factory law, has prescribed certain rules for the ventilation of rooms where wool sorting is conducted. The rules, however, do not meet, in all respects, with the approval of those in the trade, who are particularly affected. Thus far, they have been very generally respected, but efforts are being made to effect some modifications that will render them more satisfactory and efficient. To this end the matter has been brought to the attention of the Bradford Chamber of Commerce, and the District Trade and Labor Council, with the result of an agreement to certain recommended changes.

The principal new regulations, as they now exist, are as follows, briefly stated. The proposed modifications appear in italics, in parenthases:

Bales of wool shall be opened by men skilled in judging of the quality and condition of the material.

All alpaca, East Indian cashmere, Persian, and camel hair shall be opened over a fan, in a room specially set apart for the purpose, separate and distinct from any sorting-room. Each sorting-board shall be independently connected with the extracting shaft by means of an opening *(funnel shaped, not less than ten inches at the top)* not less than four inches across, in such manner that the dust may be drawn downwards. The draught shall be such that not less than twenty five *(75)* cubic feet of air per minute are drawn by the fan from beneath each sorting-board. (Note. A circular opening four inches *(too small)* in diameter, with an effective velocity of 300 ft. per minute at the opening, will be sufficient for this purpose.)

All damaged wool shall be washed *(or disinfected)* before being sorted.

The dust collected by the fan shall be discharged into properly-constructed receptacles. This dust, together with the sweepings from the floors and walls of the sorting-room and from under the sorting-boards, shall be removed twice a week and burned. All pieces of skin, scab, and clippings or "shearlings," shall be removed daily from the sorting-room, and be disinfected or destroyed.

No bale wool or hair shall be stored in a sorting-room, nor wool of any description, unless the same be effectually screened off from the sorting-room. An air-space of at least 1000 cubic feet shall be allowed for each

sorter, exclusive of any portion screened off.

It is suggested that the following new rule should be inserted: "The sorting-rooms shall be heated so that the normal temperature shall be from 50 to 60 degrees."

There is possibly something suggestive in the foregoing, of value to American woolen mills.

Woolen Imports.

For the three months ending March 31, 1897, the following imported woolen merchandise was entered for consumption: 6,000,000 pounds of rags, 1,700,000 pounds of waste, 1,600,000 pounds roving waste, etc. This shows an immense importation of woolen rags. This exceeds by 1,600,000 pounds the amount of rags entered for consumption for the six months ending December 31, 1896. The following imported merchandise was entered for consumption for the six months ending December 31, 1896:

	Quantities.	*Average value per unit of quantity.*
Wastes, bur, slubbing, roving, ring, etc.	2,220,321	.22
Garnetted and carded wastes	16,509	.11
Mungo and flocks	16,881	.11
Noils, carbonized	100	.39
Noils, not otherwise provided for	1,302,645	.17
Rags, woolen	4,416,114	.06
Roving, roping or tops	256,236	.39
Shoddy	11	
Yarns, woolen and worsted (pounds) valued at not more than 40 cts. per pound	54,200.50	.37
Valued at more than 40 cts. per pound	317,252.62	.60
Total Yarns	371,453.12	.57

Yarn Contract Rules.

The Council of the Bradford (Eng.) Chamber of Commerce, has resolved to adopt the following yarn contract rules:

In case of dispute as to counts, length, weight, or condition, the yarn shall be tested by, and according to, the rules, for the time being, of the Bradford Conditioning-house, and its certificates shall be binding on both parties.

Either buyer or seller has the right to have repeated any test, and in that case the average result of the tests shall be taken as final, and binding on both parties.

The seller, on giving due notice to the buyer, has the right to replace rejected yarn if he is able to do so within the original time of delivery.

If "delivery as required" is specified, or if no time is specified, at least two-thirds of the contract must be completed within six months, and the remainder within a further three months, and particulars furnished accordingly.

—The grower himself is the last person in the world who can hint at a disproportionate advantage to the manufacturer by reason of the adjustment of the compensatory duty, for it is the grower who puts into the tariff law the provision that the duty on washed wools shall be double the duty on greasy wool, which signifies a shrinkage of 50 per cent. between the two stages, and the provision that the duty on scoured wool shall be three times the duty on greasy wool. These propositions establish in the law a uniform shrinkage of 66 2-3 per cent. But, what is even more to the point, they compel the manufacturer to import his wools in the greasy condition.—[North.

—While the merino has always been the popular sheep in South Africa, many other breeds have been introduced in small batches, and it seems probable that in the future there will be most systematic attempts to cross with larger kinds.

—Wool-growing in South Africa has been almost contemporaneous with British occupation. A few woolled sheep had been imported from Europe prior to the close of the Dutch Administration at the Cape, early in the century, but the industry could not have been of much account, since the annual export of wool in 1820 had only reached 16,000 pounds.

KNITTING DEPARTMENT.

The Knit Goods Situation.

Slow is the best word with which to characterize the knit goods market at the opening of summer. It is the natural condition of things at this period, when everything is between hay and grass. There is no exception to the slowness in any part of the country, according to the latest reports from salesmen of several of the largest New York houses. Although it is a little early to speak with decisiveness regarding the fall outlook, there are already scattering indications pointing to sizable traffic. While some mills are in as bad shape as ever, many are in better condition than for three years. The tariff has been worked for all and more than it is worth, and the trade will have no more of it. Probably not more than a third of the underwear mills are now employed. This fact in itself is sufficient to preclude the possibility of prices going appreciably higher, even in the event of large trade, for unemployed manufacturers will be content to do business on mighty narrow margins, just for the sake of keeping their operating organization together against the dawn of a better day. The number of cancellations is surprisingly small. I talked, on one of the last days of May, with the manager of one of the departments of what is perhaps as large a dry goods house as exists. He assured me that taking all their lines together, the business of the concern from December 1, 1896, to June 1, 1897, will total more than double that for the corresponding period a year earlier. This estimate, of course, covers dress goods, velvets and every branch. Underwear fell far behind most of the departments, being about five per cent. less than for the same time last year. The product of more than half the dozen or more mills controlled by the concern are sold out of sight for a year to come. This, by way of digression, simply to show that here and there the leaden clouds have a silver lining. Woolen knit goods and those into which wool enters, are, of course, much stronger following the tariff agitation, but there is a general feeling that advances have been fully discounted. Strange as it may seem, the bulk of retailing in summer knit goods has yet to come. It is a fact that on May 20th the largest dry goods store in New York had not received its summer weights of underwear from its importing agents. The manager of the department, in speaking about it, did not manifest the slightest solicitude. As the same concern has another equally large store in another city, it is fair to assume that the other emporium was also without its summer underwear imports. Naturally the extremely backward spring is largely responsible for this delay, but beyond this is the fact that people who formerly made three changes in weights of underwear during the year, now make but two, and do not buy until the really hot days of May or June force them to. A dry goods man, who has a comprehensive view of the entire field, waxed prophetic the other day, declaring that a new era had opened, one of greater economy, more conservative buying, keener competition, restricted expenditures, etc. Perhaps the last named may be hard to believe, in view of congressional and municipal tendencies, but otherwise there will be no hesitancy in accepting his statements. This metamorphosis which the last four or five years has brought about, and was first evidenced by what was dubbed "hand to mouth" buying, is slowly being realized. The most progressive houses are rapidly adapting themselves to the changed conditions. They do not expect in the end to suffer by them.

Expecting that the tariff will be out of the way by September, the New York trade is preparing for at least a reasonably busy fall and increasing volume of winter business. There are few, if any, exceptions to the cheerfulness.

(Translated for the TEXTILE WORLD.)

Knitting Industry in Saxony.

The Cologne Times, one of the most powerful papers in Germany, published the following as a salve for those who feel dejected and see nothing but disaster for the German knitting industry, in the enactment of the Dingley tariff bill: "The threatening tariff rates in the United States, have caused a great many comments for and against the future of Saxony's industries. Most of what one hears is full of black prophecies. Overweening optimism is often as dangerous as too much pessimism. It leads to looseness; and this to losses. But too dark or too deep a despair lames enterprise and hinders energetic effort in fighting for first place in foreign fields. Saxony depends upon its export for its continued existence at the head of Germany's industrial States. Let her lose these and the whole empire suffers a shock. The better our technical development, the better chance we have to win our way in foreign markets. It is feared by many, in Saxony, that they must lose their foreign trade, especially in the United States, and make up for it in farther away and poorer paying places. These fears, if not entirely justified, are founded on palpable facts. Saxony's industries have developed wonderfully; but so too have the same industries in the lands to which her goods have been going, more especially in the United States. Belgium, Italy, Holland, Sweeden, Norway and Spain, are making many wares bought formerly in Berlin, Barmen or Chemnitz. Even Russia is trying to walk alone, and the Japanese are making in their own mills, under men trained in Germany's schools, millions of yens worth of wares, bought, hitherto, here.

"Through these losses Saxony saw herself compelled to seek sales in other countries. The major part of her manufactured products went to the United States. If she loses this territory, she will find herself in the most painful industrial condition. It is feared that she must make up her mind to lose this, the best market for her manufactures. This, however, is not to happen, because of Mr. McKinley's duties, or Mr. Bryan's silver agitation. Such measures may shock, but they cannot destroy Saxony's industries. It is in America's industrial development that she has much if not most to fear. Even this fear is not entirely justified; although some goods are made in the States that Saxony sent for years. Experts from Saxony sought a solution of the problem, recently, by means of most careful examinations on both sides of the water. They are entirely satisfied that a long time must elapse before the United States can build mills, put up machines and train help to take away the best paying part of the present trade. America needs not only the trained help, but the entire industrial system that is aiding Germany to gain new markets and to hold them against her greatest rivals. Take knitting as an example. Many make a mistake when they think or say exports in this branch are soon to be made impossible for Saxon knitters. Experts are satisfied that no real competition has begun. It is true that many knitting machines have been sent or sold to the States, but success in running them has yet to be recorded. Only certain inferior grades have thus far been made. The largest part of the export in knit goods, the part that makes up the millions annually, cannot be made in the United States. For these grades trained help and the higher grade machines fail. The American manufacturer and foremen lack the necessary preliminary training and experience, not only in

the matter of machines, but in designing, finishing, etc., etc. Here we have all that hereditary gives a people. All this cannot be built up on artificial bases. It must grow. Granted that the Americans are clever, it takes time to build up a successful industrial system. Hence the future is by no means so dark. To despair is to do a very foolish thing in the face of the facts. There are men with hope, energy and enterprise. These will keep what has been so hard earned. These are winning new markets for German products. Austria and France, in the Orient, have had to yield to German goods, places held hitherto by French and Vinnese wares. South America, in spite of seemingly, almost insurmountable, difficulties, is adding yearly more and more to our export list thither."

The Manufacture of Lace Hosiery.

The principle of using a grooved point for the taking of a finished loop from one needle and placing it upon an adjoining one, leaving a needle empty, and so forming an eyelet hole, has been in vogue for many years. Today the point is one of the most useful additions to the bearded needle machine. It is not intended in this article to deal with the point as used for narrowing, or for the purpose of making network as in the fall trade, but simply to confine ourselves to the making of lace designs upon children's or ladies' hose. In making such a design upon the ordinary hand frame, if the same was in any way ornamental, two or more machines would be required, and these may have to make several movements in the same course; for when a machine is set for one pattern, it is usual for the machine to be kept for same, using such machine only when the particular pattern it is set to, produces as required.

Fig. 1 illustrates this principle. Here part of a simple pattern is shown, each square representing a loop, those in black representing the loops removed, and therefore the eyelet holes. This comprises three different designs, *D* being the edging design, *E* and *F* two leg designs. The first machine to produce the design *D* has one point and seven blank across the whole number of needles. This point at course 1 is brought down upon needles 6, 14, 22, 30, etc., as shown at *A*, *B*, and *C*, and the loops removed in the usual way. Course 2 is a plain course. At course

Fig 1

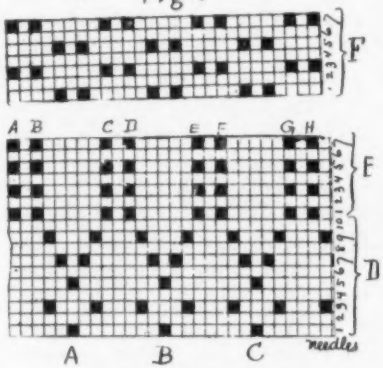
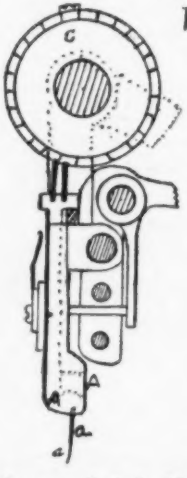


Fig 2



3 it will be seen that double the quantity of eyelet holes are made, but the same machines are used, first taking the points upon, say, needles 4, 12, 20 and 28, each of which are eight needles distance from each other. These loops being removed, the points are shifted to needles 8, 16, 24, etc., which are

again eight needles apart, and the same process is performed; thus the machine has had to make two distinct movements in order to get the required result as shown at course 5. The points are used as at course 1, and at course 7 two shifts are required, first at needles 5, 13, 21, etc., next at 7, 15, 23, etc. At course 21 begins pattern *E*, which is a number of horizontal stripes of two eyelet holes. These could be made with the same machine, but two movements at each designed course would be required. So, as the pattern is continued for some time, a machine with the points set in pairs for needles 1 and 3, 9 and 11, 17 and 19, 25 and 27, etc., is used. At pattern *F* is shown a change made with the same machine, this being moved sideways, each alternate designing course making the design a zig-zag, instead of perpendicular as before. More complicated patterns necessitated a greater number of movements at the one course, besides a number of machines being used at intervals.

A great development was made in 1888, when Messrs. Clarke & Mawby, Leicester, Eng., patented the principle of independent moving points, operated automatically, the selection being determined by a Jacquard mechanism. This system was alike applicable to ordinary rotary or Cotton's patent rotary frames. On the Cotton's patent, suitable brackets attached to the narrowing machine carried other brackets and brass trinks, in which worked slides, one of which is shown at *A* Fig. 2, *a* being the point required to shift the loops as they are pressed down to a working position. The slides are lifted out of action by a bar attached to the brackets, and are held up by the springs shown. A cylinder *C* is mounted upon a shaft, on which it rotates, there being one of these cylinders for each set of points. The outer surface of this is formed of longitudinal lags or plates, suitably fixed, and perforated with holes, opened or filled by means of plugs, according to the pattern to be produced. These revolve, and as the plates are open or filled in, certain points are brought into action at each course. Thus any pattern may be produced, as at each course different guides are brought into action, and all loops to be moved have points in position, the whole being done at one operation by the ordinary principle; thus according to the circumference of the cylinders, so a number of plates each are designed, according to the pattern to be produced. The necessary mechanism is, of course, added for the satisfactory working of cylinders and points, and the Jacquard cylinders descend at each required course. When designing is to take place, all open perforation leave the corresponding points out of working position, by reason of the same not being pressed to working level. When such perforations are closed, then points are taken to working position. Thus, to produce a given design, the Jacquard cylinder is first set out, and the design is accordingly produced without further study, all the movements being automatically performed.—[Knitters' Circular.

Bicycle Stockings.

The bicycle is responsible for many new styles of knit goods every season. The persistency of ordinary bicycle stockings and leg gearing to wrinkle and roll downward in spite of the many methods employed to prevent such troubles, has led some manufacturers to believe that articles made according to the plan suggested in figure 1 will be acceptable next season. But it is not only that the regular cycle stocking refuses to keep straight and in place that would make a garment like that shown preferable, as there are several other points of advantage. Being in one piece, practically, the setting of the garment is more to the advantage of the cycler than is the case where two or more pieces are worn. The adjustment at

the knee is freer and much strapping is avoided. Anyway, manufacturers of knit cycling sporting goods are confident of a demand for these long stockings as soon as the bicycle season opens, and are preparing to meet such a demand. As the drawing explains the shape and general arrangement of the stocking, a detailed description of its manufacture is unnecessary. The bottom is made according to the regular

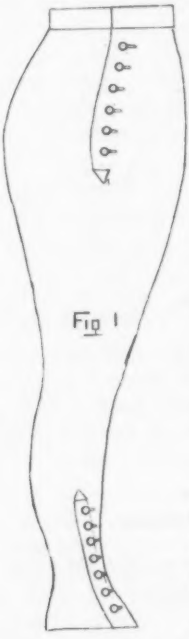


Fig 1

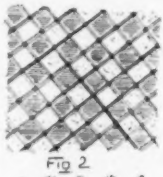


Fig 2

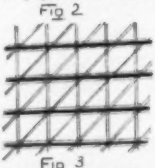


Fig 3

Fig 4

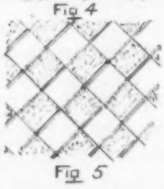


Fig 5

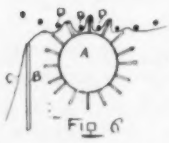


Fig 6

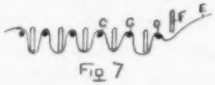


Fig 7

gaiter plan, fitted with buttons, etc., as shown.

The upper or waist band will be leather and furnished with a buckle or other fastening device. Particular attention will be given to the style of the designs in the garments, and also to the character of the stitches in the knitting. A cycle garment must be artistic in its design. Some designers of cycling knit goods tell me that they are obliged to go beyond the bounds of reason, and disregard many of the long-observed laws of color harmony and figure setting in order to meet the demands from some large bicycle goods houses. Oddity of design and uniqueness in color arrangement predominate now. Some patterns which formerly found their way into the waste basket owing to the lack of attractiveness and beauty, are now the rage. Chance designs in which the pattern loom has brought out some apparently ugly, yet peculiarly odd and striking effects, will oftentimes sell, while the handiwork of the skilled designer, which is correctly colored and planned accrding to the laws of designing, is frequenly not wanted. In forming the designs for these long cycle stockings, therefore, the designers are directed to prepare some peculiar looking patterns. Several of such patterns are represented in the drawings as examples. Designs of this character are now readily produced on patent automatic machines, and in some cases without the need of employing Jacquards. The automatic blocking machines of both Americnn and English make are well adapted to the work, and on them the garments may be knit from cotton, wool, silk, worsted or other yarns, any guage, ordinary rib or plain texture and seamless, if so desired. The fabric may be knit plain and checked off as shown in figure 2 by the blocking chain attachment, and a good effect produced by using the right colors, which of course will be arranged to suit the ideas of the manufacturer and purchaser. Fig. 3 is another block pattern, which is given a diamond presentation by hlaving the block exchanges, a process readily accomplished by an alternate movement of the pattern forming attachment. The straight lines are produced in the fabric, as in figure 4, by bringing to the surface certain colors at the right time, floating them underneath when not wanted. The flake lines are made by running in

double and twist yarns. Style 5 is unique when in the cloth, and is easily knit on an automatic blocking machine with three colors, bringing the checking lines to the face alternately.

Cycle garments that go above the knee must be very elastic, so as to afford the wheelman or wheelwoman freedom of motion. Everything should be done to make the stitch as elastic as possible. Some of the old types of American machines do not form such elastic stitches as modern makes. The tendency of the plan of the sinker blades and wheel is to stretch the yarns and reduce the elastical feature if not watched. In Fig. 6, for example, is the wheel *A*, the guide *B* and the yarn *C*. The needles are marked *D*. Ordinarily the yarn is drawn over two or more blades before it is formed into a stitch as shown. The tendency therefore is to stretch the yarn. There are many ways introduced in modern machines to avoid this, so that unless the manufacturer who intends to make these cycle garments has an equipment of machines a dozen or two years old, he need have no concern regarding the stitch and loss of elasticity. In such machines as have independent sinker blades that are operated with cams, a very elastic stitch is procured. Fig. 7 shows the plan of this type. The yarn is marked *E*. The needles signified *G G G*, and the sinkers between are marked *F*. The arrangement is such that the last sinker always has the loop fully formed before the next sinker (*F*) falls. Hence, there is no drag on the yarn, and it is knit with comparatively little of its original elasticity taken out by stretching. BOSS KNITTER.

Knitted Fabrics.

CARE TO BE EXERCISED.

The cutting up of a knitted fabric is a matter of much importance to the trade, and a poor cutter is a big expense to the manufacturer. Some may ask how is that? Simply in cutting to disadvantage, where a bad place occurs in the cloth; through sheer carelessness in not having an eye to the work. A great many imperfections may be cut out by looking over the cloth before cutting it, and a cutter who does not see to it and practice economy, the sooner a change is made the better for the manufactuer's purse.

Next is the looping and seaming, both of which must be done with great care. The loopers should never be allowed to use wire brushes to rub off the waste above the stitches, as they are liable to cut the thread and do other injuries which may not be discovered until the garment is being boarded. Although the mender may do her best afterwards it never looks so well. All this is where trimming is done by hand. There is a number of patented devices which are attached to the looping machines, styled ravellers, which work very satisfactorially on nearly all lines of goods, and are of great benefit, and a saving to the Manufacturer of two cents per dozen on sleeves and drawers, and from 4 cents and upwards on shoulder looping and skirts. The reason for this is that a girl can do so much more work and easier, than trimming and ravelling by hand. The seaming is easily done where machines are in good order, and very little bad work need come from that department, but the trimming should never be too close for fear of ripping, that may not be observed until the boarding, for the washing of garments will take off more or less of the loose stock. The stitching should be from 14 to 16 stitches to the end where close trimming is required.

Finishing is a very important part in the knit-goods industry, for here a good margin may be made to the Manufacturer by a little tact in getting up new designs and a neat finish at a small expense, and a good trade may be secured for a time until some one else gets hold of the idea; or money may be lost by always following the old

rut as some mills do, in not keeping pace with the times. As our Manufacturers and Merchants are making a strong and concerted movement to increase their foreign trade, they should avail themselves of every practical hint that may tend to aid their efforts in that direction. One in particular should be attractive packages, as such things catch the eye of purchasers in general; and when the consumer's taste for a line of goods is cultivated 'tis hard to change it; for the time has come when the whims of the consumer must be tickled, and the Manufacturer who succeeds, must be the one who has solved the problem, as to what the people want and then gives it to them. The old methods were all right years ago, but the progressive Manufacturer must needs keep up with the times.

A saving in time, and money, will follow, where experience and trustworthy help are had, and first-class machinery used. It is noticiable this season that some mills I have visited lately, are making a class of goods which excel in several features, as in design and finish. It is to be observed that in mills which have been erected in late years, and have been equipped with the latest types of machinery, a better line of goods is manufactured in quality, style and finish.

Manufacturers, pray take warning, for the old time methods will not suffice, for within the memory of every one now living except children and youths, machinery. tools and implements of all kinds, now in use, have undergone radical improvements. Devices unknown a few years ago, have already become necessities; as it is no use for Manufacturers to waste time and capital and say that old ideas and methods will do, which years ago was put aside. OLD SUPERINTENDENT.

—Of all parts of the toilette, the necktie is the only one which appertains to man, and wherein he finds his individuality.

Exports to the United States from Bradford.

The following statistics show the value of declared exports from Bradford, England, to the United States during the month of April, 1897, and for the corresponding month in 1896. The comparison will be interesting, showing a large increase of exportation from that quarter to the United States. The increase in value is over 500 per cent.

Articles.	*April, 1897.* £	s.	d.	*April, 1896.* £	s.	d.
Wool	465,610	19	6	15,704	0	0
Stuff Goods .	302,492	3	3	64,383	15	4
Worsted Coatings . . .	154,394	16	10	46,043	14	3
Tops	79,790	17	7	.....	..	..
Woolen Goods	54,667	16	3	36,290	13	8
Noils	47,581	7	11	152	12	6
Mohair Goat's Hair . . .	20,460	0	7	.....	..	.
Worsted and Mohair Yarns . .	16,332	14	4	1,919	1	5
W'sted Waste	12,626	13	6	132	2	9
Laps	11,536	4	1	731	11	9
Camel's Hair Tops and Noils . .	9,850	19	0	.....	..	..
Miscellaneous	.....	..	..	.....	..	..
Totals	£1,227,483	15	8	£202,178	3	4

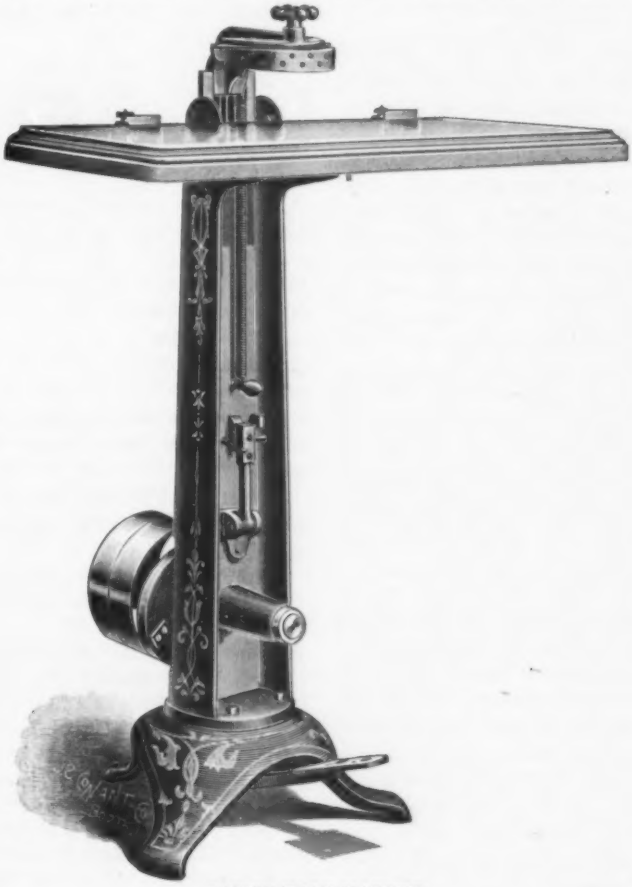
—In brilliancy of coloring, in style of ornamentation, in softness and beauty of texture, certain old Japanese robes have a peculiar charm for Western people, they being unlike anything to be found amongst the productions of other nations. Many are made from soft silk which is divided into panels and painted with trees, flowers, birds and insects, upon a groundwork of different shades and tones; then at intervals gold is powdered about the fabric. In others, the required effects are obtained by enlisting and skillfully combining the art of the weaver, the painter, the printer and the embroiderer in a way which would occur to no one but a Japanese.

—The combing wools, which, under tariff phraseology, exclude all crossbred wools, are used only in goods for women's wear, and chiefly when lustre effects are desired.

—The worsted manufacturers have to-day as much interest in the duties on clothing or merino wools as in the combing-wool duties.

New Power Neck Marker.

We illustrate herewith a new power neck marking machine made by Thomas Kennedy, Cohoes, N. Y. The principal features of this machine are its speed and accurcy. The operator can easily mark from 200 to 250 dozen garments per day. Another advantage is that no pencil marks appear on the goods. It is a great improvement over old methods. The different forms or patterns for the necks can be changed in a moment from one style or size to another, and perfectly accurate work is assured.



POWER NECK MARKER.

—It has long been the conviction of the American wool manufacturers that no woolen tariff based upon the *ad valorem* method in its protective duty can be effective, to the degree intended by the framers of the law, because of the opportunities for undervaluation which that form of duty affords.

—It is to be deplored that the foreign elements which introduced new life and thought to Japan, also ushered in a period of decadence in handicraft arts. At present the Japanese, in their desire to conform to Western taste, appear to be incapable of blending and harmonizing their own art with that of Europe; but with a people so fanciful as they are, the time cannot be far distant when a new style of design will be forthcoming, which, it is hoped, will represent new thought engrafted upon the best traditions of the past.

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POWER DEPARTMENT

O. R. YOUNG, M. E., Editor.

A Reminiscence.

T. G. FILLEBROWNE.

Happening into an engine room of an electric light station some ten or twelve years ago, I was the observer of a little incident which occurred a short time after starting up for the run.

"How much steam have you got down there?" called the chief engineer down the stairs to the new fireman who a few hours before had been instructed by the chief engineer as to the requirements in the boiler room, this being his first night on.

"Eighty pounds, sir," came the answer back promptly.

The occasion of the inquiry by the chief was because he had noticed that the engine, which was about 300 h.p., was cutting off extremely long, in fact, at about the limit of the governor, and the load not all on yet.

After an examination of all the engine bearings, to be sure that nothing was getting hot, and finding everything running cool, he was beginning to feel a little anxious as to the cause of the unusual cut-off. Although having given the fireman orders to be sure and give him eighty pounds of steam, he called again to that worthy knight of the coal shovel, with the same inquiry, and received the same reply: "Eighty pounds, sir."

Another hasty inspection of the engine was made, even to the cylinders, fearing they might be cutting, and finding no evidence of anything wrong, the chief ran up stairs to the dynamo room to learn if there was trouble there. The dynamo men reported all right, except they thought the machines were running a little slow.

Back to the engine room came the engineer, and on to the boiler room this time, to see for himself what the conditions were, feeling sure that something was wrong there.

Judge of his surprise and indignation at finding the fireman calmly seated on a nail keg, and only forty pounds of steam on the two large boilers in the basement; then turning to the fireman, a hasty conversation, something like this, followed:

"What is the matter here, didn't I tell you to keep eighty pounds of steam on these boilers?"

"You did, sir."

"Then why don't you do it?"

"I have, sir."

"No you have not; don't you see there is only forty pounds on the boilers?"

"Well, there is forty pounds on this boiler and forty on that one, and isn't that eighty pounds?"

"Well, you just get eighty pounds on both of them, and be mighty quick about it!" exclaimed the engineer as he went back to the engine room.

Now Uncle George (as the boys called him) did not often get riled, but on this occasion forbearance ceased to be a virtue, and if there was not enough pressure in the boilers, there was plenty of it in some of his remarks to the fireman, and what was lacking in politeness was amply made up in potential.

It seems that the fireman had fired only single boilers before, and thought that with two boilers and forty pounds on each, that the pressure would be eighty pounds.

Thanks to the Massachusetts license law, and the careful examinations of our efficient state inspectors, representatives of this class of firemen are seldom met in this State at the present day.

The time is also past when the office boy runs the boiler and engine, as frequently has been the case in small plants of six or eight horse power, the following being one which came under the writer's notice.

The apprentice boy in a small printing establishment was supposed to take care of the boiler and engine of about six horse power, start the fire in the morning, and have steam up ready for business at seven o'clock. It was his custom to run in early in the morning, start the fire, then go home to breakfast, and on his return, just before seven o'clock, would usually have a good fire and plenty of steam, but one particular morning, being a little late in getting back, he took a hurried glance at the steam gage, finding apparently no pressure, so he at once threw in all the wood he could find handy, and as the pointer on gage still remained at the pin, he went to the office and reported to the owner that he could not raise any steam, that he had started the fire as usual that morning, and had a first rate fire then, but could get no steam.

The owner told him to put on some more wood and stir up the fire and make haste, as they must start in a few minutes. He did so, but soon returned, saying he could not get a pound of steam.

The owner then went with the boy to the boiler to see what was the matter, and upon looking at the steam gage carefully discovered that the pointer on the gage had gone round once, and was hard up against the pin on the back side, and had been there ever since the boy came from breakfast. He opened the fire, put on some fresh coal and carefully started the engine. In about half an hour the pointer began to leave the pin, and in time reached its usual place at seventy pounds.

The gage was graduated to 150 pounds, and it is only conjecture as to just what pressure was reached, but probably 200 pounds, as the safety valve had been removed for repairs and a stop valve substituted for temporary use.

The boiler being nearly new and of good material, withstood the strain without apparent injury; others would have gone skyward, and probably carried more valuable lives with them, and one more mysterious explosion would have been recorded.

Another instance of unbounded recklessness came under personal observation within the past year in a small manufactory, where several girls were employed on sewing machines in the same room with the engine and boiler.

The engine was a slow running, 5x7 cylinder, and the boiler a vertical, three feet in diameter, and about ten horse power, of very uncertain age, with a large crack in the centre of the crown sheet, which had been patched with a piece of sheet copper.

There was no necessity for carrying over fifteen or twenty pounds of steam, as the work was very light, but the engineer had a bad habit of firing up and adjusting the feed water supply (city pressure 90 pounds) so that he thought it would be about right to keep the boiler supplied, and then would go down town for an hour or two and leave the whole business with the girls.

Occasionally he would leave on too much water supply, and in a short time the boiler would be full of water and run over into the cylinder and stop the engine; when it ran out of the safety valve some of the girls would close the throttle and shut off the water, while others would go out hunting for the proprietor or his assistant.

At other times when he went out he would not leave enough water on, and steam would go up to eighty or ninety pounds, and as the governor valve leaked some, the engine would get up a lively speed that would frighten the girls from their work, until one more courageous than the rest would shut it down, and wait around that boiler unconscious of the danger until the engineer returned.

This condition of affairs went on for several months, the boiler not being insured, and consequently not inspected, and no limit prescribed as to

pressure to be carried, or any regulations as to care and management, until one day a state inspector appeared on the scene, and upon a thorough examination of the boiler found there was not a stay bolt in it.

When it was again fired up, there were plenty of stay bolts and a new pop safety valve attached and set within a safe limit of pressure.

It is in cases of this kind, and others of similar character that the value of the state boiler inspection is very much in evidence. Had this boiler gone up there could have been nothing mysterious about it, but rather the mystery would seem to be that the boiler and the operatives around it are still on earth.

During the writer's service of several years as erecting engineer, an experience occurred that may be useful as well as interesting to others.

Being requested to visit a steam plant of about 400 horse power, to investigate as to the advisability of coupling together two condensing engines which were rather peculiarly situated, and designed to run independently of each other, one being held in reserve in case of injury to the other, and both piped to the same independent Deane condenser, which did duty for either one, as the case might be. One engine was an 18x42, with releasing valve gear of the Corliss type, and the other an 18x36, with a shaft governor, with what is known as a positive valve gear. The speed of the 18x 42 was 85 revolutions, the 18x36 being 95 revolutions per minute.

The 18x36 was first installed, and coupled direct to the main line shaft, and later, to guard against emergencies, the 18x42 was added, placed in same room, and set at right angles to the other, and connected to main line by a set of adjustable bevel gears.

It was supposed that either engine was well able to do the work, but as is frequently the case in mills in general, the load soon increased beyond the capacity of either engine. It was not expected to exceed 200 horse power, but it did, however, until 325 horse power was required to do the work. Then the question of more power became a very important one, and the manager being somewhat in doubt as to the best means to obtain it, consulted the builders of the Corliss type of engine as to the practicability of coupling both on to the main line, running one non-condensing if necessary.

The report was adverse to such an arrangement. Just why, I never knew, but understood that the different speeds of the two engines, and other conditions in general, were advanced as unfavorable for satisfactory results; but the suggestion to build a large engine that would do the work alone would seem to have some remote connection to such a flexible argument.

The manager was not quite satisfied on these lines, and applied to the builders of the other engine for a little advice on the subject, and as there was quite a difference of opinion in the matter between the two builders, the writer, as above stated, was detailed to investigate, and arriving at the plant for that purpose found the engine with the releasing gear running.

Assuming temporary charge of the engines, we continued to run this one for the rest of the day, taking cards from it at regular intervals. It was extremely overloaded, the cut-off being so late that every few seconds the valve gear would fail to unhook, and steam following full stroke caused the engine to race; hence, uneven speed and sudden and severe strains throughout the whole machine.

It was a relief when the time came to shut down, which was in the morning (the plant being run day and night). We then started the engine with the positive valve gear, Fitchburg make, with same load, taking cards as before, and though slightly less in rated power, the work done by the engine was more satisfactory, as there was no racing of engine and even speed, due to the positive action of the valves being sure to cut off at the proper point within the limit of its range, which is about three- quarters stroke.

In a day's run of each engine, noth-

ing occurred to indicate that they would not run together, but it was evident that a large saving of steam would be effected by connecting them together, that the condenser would handle them easier and lessen the work of the air pump; so the third morning we connected both engines to the main line, and started up for a day's run, both engines using same condenser. One stop was made for an adjustment of speed on the Fitchburg engine, all subsequent adjustments necessary to equalize the load being made on the Corliss engine without stopping. A few changes, and the cards from each engine showed a difference of less than five horse power, cutting off at about one-fifth of stroke, which we considered good enough.

The engines were working under most economical conditions; vacuum had increased from twenty to twenty-five inches, the back pressure was entirely removed, everything seemed unusually smooth and slick. The superintendent came into the boiler room next morning, and was a little surprised to find between three and four tons of coal estimated left over from the usual amount required for a day's run, which was about sixteen tons.

"Where did you get this coal?" he asked of the head fireman.

"It was left over from yesterday."

"Any more brought in than usual yesterday?"

"No sir, same as usual, 154 wheelbarrow loads."

The superintendent was not very talkative next day. Just a mention of coal, and he had something important to attend to in some other part of the mill, for he did not care to say much about the coal pile.

Leaving them that afternoon I called again in about three weeks, being in that vicinity, found engines running as I left them, asked superintendent how he liked the arrangement. He replied, "First rate."

How much coal are you burning?"

"Oh, we are burning a pile of it."

"Well, how much of a pile?"

"More than we did before, probably twenty tons added."

Being somewhat surprised at this statement, it was found that the twenty tons were from a cargo of a cheap grade of coal, $2.25 per ton, while with the former condition the best coal to be had was used at $4.00 per ton.

16 tons at $4.00=$64.00.
20 tons at $2.25=$45.00.

Balance in favor of present arrangement, $19.00.

As far as I know these engines are still running together and doing satisfactory service.

Efficiency of Alabama Coal.

Editor Textile World:

Will you give me the production of coal in Alabama, and its relative value and price with coal mined in West Virginia and Pennsylvania, such as is used by New England mills? I am particularly desirous to know the steam efficiency of this coal.

Boston, Mass. C. P. B.

[The above inquiry which has come to us, similar to many others, is for the purpose of getting more clearly at the reason of the advantages, if any, for the establishment of cotton mills in the Alabama coal region, instead of elsewhere in the South. The principal reason for selecting this section for the erection of such establishments is well understood to be on account of its proximity to the coal mines, and the relatively low cost of the product delivered at the mills. There is, undoubtedly, a great saving in this respect, enough to make the use of steam power far more economical than that derived from water, under the most favorable conditions. The coal that is mined in Alabama is bituminous. The total coal product of the United States is about 135,000,000 short tons, with an average cost at the mines of 86 cents per ton. Alabama is the fifth State in the amount of coal mined, Pennsylvania ranking first, and West Virginia, fourth. The cost of coal is 68 cents per ton in West Virginia, 72 cents in Pennsylvania, and 90 cents in Alabama. These prices are ten to twenty per cent. less than they were in 1891. The county of largest

production in Alabama is Jefferson, where the average price of coal per ton is 87 cents, or 3 cents less than the average for the State.

In regard to the heating value of Alabama coal for steam making purposes, we have to say:

1. Five analyses of Alabama coal are given in the catalogue of the Hawley Furnace Co. as taken from various official reports. Correcting these for some obvious errors and averaging we find:

Moisture	1.2
Volatile combustible .	33.8
Fixed carbon	59.4
Sulphur	1.3
Earthy matter . . .	4.3

These analyses indicate a coal standing in value somewhere between the coal from Clearfield and Cambria counties, in Pennsylvania, and the coal from the Pittsburg region a little farther west. Such a coal would be rated at about 90 per cent. of good Cumberland.

2. The U. S. Navy had a number of chemical analyses made during 1893-5. These showed the volatile combustible to be somewhat lower than the above analyses, or about 29 per cent., while the fixed carbon was higher, or about 65 per cent. This would rate the coal at about the same as the Clearfield coals, or about 93 per cent. of Cumberland.

3. The U. S. Navy, during the period referred to, had a number of practical tests made at sea. On the Columbia, Pratt coal from Alabama took the same rating as Elk Garden coal at a rating of about 87 per cent. of Eureka coal. On the Montgomery, Milldale coal took a rating of 110 per cent. as compared with Pocahontas, while Coal Valley coal took a rating of only 82 per cent. approximately.

4. In the period 1895-6, the U. S. Navy reports no further chemical analyses, but a practical trial on the Dolphin gave Pratt coal a rating the same as Reynoldsville coal, and 87 per cent. as compared with Cumberland.

5 The report of the Quartermaster General of the U. S. Army, for 1894, rates two Alabama coals and also Pennsylvania anthracite. The latter is probably the large size, as the coal is used for cooking, etc.; and if large size anthracite is taken as 97 per cent. of Cumberland, the rating of the Alabama coal reduces to 75 per cent. of Cumberland.

Recapitulating, we see that the ratings range from 110 per cent. down to 75 per cent., but excluding the highest and the lowest, they all run between 85 per cent. and 95 per cent. of good Cumberland coal. The army tests are, it is understood, made under a very small boiler, under conditions not favorable for a coal containing as much volatile matter as the Alabama coals. The navy tests are subject to a certain amount of error, as the weather and other conditions may not be the same. The figures given are therefore not conclusive, but so far as they go they indicate that when properly burned, Alabama coal has a value of about 90 per cent. of good Cumberland. Since the coal contains more volatile matter than Cumberland, it needs a somewhat better fireman, and somewhat more care must be given to the design of boiler and furnace than is necessary with the harder coals.

W. B. Smith Whaley, Columbia, S. C., is familiar with Alabama coal and others, from practical experience, and he must have some valuable data on this subject.

Compressed Air.

The application of compressed air for the transmission of power and other uses is exciting the attention of engineers, more and more, as progress in this direction is being made. One of the most valuable applications of compressed air is for the pumping of water for manufacturing and other purposes. Perhaps the most conspicuous system now in use for pumping water from artesian wells by means of compressed

air, is that known as the Pohle air lift. The operation of this system is by two properly proportioned pipes placed in the well, the one an air pipe leading from an air compressor and connected with the other—the water discharge pipe—near its base, through what is known as the foot or end piece. The compressed air is forced through the air pipe into the foot piece and water pipe, and by its inherent expansive force, layers or pistons of air are formed in the water pipe, which lift and discharge the layers of water through the end of the water discharge pipe at the surface or tank. At the beginning of the operation, the water surface outside of the pipe and the water surface inside of the water pipe are at the same level; hence the vertical pressures per square inch are equal at the submerged end of the pipe, outside and inside. As the compressed air is forced into the lower end of the water pipe, it forms alternate layers with the water, so that the pressure per square inch of the column thus made up of air and water, as it rises inside of the water pipe, is less than the pressure per square inch outside of the pipe. Owing to this difference of pressure, the water flows continually from the outside to within the water pipe by gravity, and its ascent through the pipe is free from shock, jar, or noise of any kind. The economy with which this system may be operated is, to a great extent, dependent upon the efficiency of an air compressor. In simplicity, durability, facility of use, high efficiency and ultimate economy, this system has many conspicuous merits. No valves, buckets, plungers, rods, or other moving parts are used, and there being only one or two plain pipes in the well, little or no attention is required.

—Cold water should never be fed into any boiler when it can be avoided, but when necessary it should be caused to mix with the heated water before coming in contact with any portion of the boiler.

Fuel Wastes and How to Prevent Them.

If a manufacturer was to step into his boiler room and find his engineer or fireman shovelling dollar bills from the safe into the furnace, he would think the man insane, and yet coal represents an outlay of dollars, and is in consequence dollar bills to that extent.

If coal represents dollars, then the less we can use of it to produce given results the better, and if manufacturers and engineers would only think for a moment, they would see that they are not only shovelling dollars into their furnaces, but also throwing in two dollars where there is only necessity for one.

Many a steam plant to-day is wasting one-half the fuel used, by the neglect to remedy what seems to the engineer to be unimportant wastes. A few figures in this line may prove interesting.

Take for instance the loss occasioned by scale in boilers, and by far the greater majority of boilers are more or less scaled, and needlessly so, for it is an easy matter to keep boilers clean if handled rightly.

Have you ever thought how much that scale in your boilers is costing you? Just think for a moment. Say you are using only ten tons of coal a week.

One-sixteenth of an inch of scale means a loss of 12% of fuel; one-eight of an inch of scale, a loss of 30% of fuel; one fourth of an inch of scale, a loss of 66%; and one-half an inch, of scale a loss of 150% of fuel.

Take your plant, say consuming twelve tons of coal at $4.50 per ton, or $54 per week. If your boilers have one eight of an inch of scale on them, you are throwing away $17.20 per week or $894.40 per year, with one-fourth inch of scale $1853.28 per year. And this too on a small plant using but twelve tons of coal per week. Take a plant using 24 tons per week, and it loses $1788.80 per year by one-eight of an inch of scale, or $3705.96 by one-fourth of an inch, and the number of boilers to-day having from one-eight to one-fourth of an

inch of scale in them are more than common, in fact to-day the boiler without scale is almost a rarity.

Just see how much coal you are using, then examine your boilers and see how much of a dividend you are throwing away on scale. The amount is easily computed and the matter is certainly worthy of your attention.

While this scale may be removed easily and safely by ascertaining the composition to it and treating it understandingly, no engineer should attempt to free his boiler of scale by feeding into it all sorts of stuff, the combination of which he has no knowledge, as in doing so he is more than liable to remove his boiler at the same time.

Every engineer who has the interests of his plant and employer at heart, (and every good engineer has), should see that his boilers are kept free from scale, for a man who can save his employer from $17.20 to perhaps $35.64 per week is certainly to receive part of that as an addition to his wages, besides having the satisfaction of saving himself the labor of handling from three to ten tons of coal additional.

Water.

Water with a barometer at 30° boils in the open air at sea-level at 212° Fahr., and in vacuum at 88° Fahr. The less the pressure of the atmosphere, the lower is the temperature at which water will boil. The pressure of the atmosphere at sea-level is 14.7 pounds per square inch, pressing equally and in all directions. This has been ascertained from the following illustration: Because the height of a column of air of one square inch area exactly balances a column of mercury of the same area 30 inches in height, and also a column of water 33.86 feet in height, it follows that a column of air, 30 inches of mercury and 33.86 feet of water weigh the same; and since the last two weigh the same, respectively, 14.7 pounds per square inch, a full column of air must weigh the same. A cubic foot of water, evaporated under a pressure of one atmosphere, or 15 pounds per square inch, occupies a space of 1700 cubic feet.

Salt water boils at a higher temperature than fresh, owing to its greater density, and because the boiling point of water is increased by any substance that enters into chemical combination with it. The density of water decreases as the temperature increases, since heat destroys cohesion and expands the particles, causing them to occupy greater space. The power of water to hold chemical substances, such as salts of lime, in solution decreases as the temperature increases; from this follows that boilers carrying high pressure of steam form more scale than those working at low temperatures.

The law of expansion by heat and contraction by cold is true as relating to water, with this exception: that, as hot water cools down from the boiling point, it contracts until 45° Fahr. is reached; but if it cools down from this point it expands again. In other words, from 32° to 45° Fahr., the density of water increases; above the latter temperature, the density diminishes, because water is expanded into a greater space by an increase of temperature. Water has the greatest specific heat of all known liquids except hydrogen, and is therefore taken as the standard for all solids and fluids.

—All heating surfaces about a boiler must be kept clean, outside and in, or there will be a serious waste of fuel. The frequency of cleaning will depend on the nature of fuel and water. As a rule, never allow over 1-16 inch of scale or soot to collect on surfaces between cleanings. Hand-holes should be frequently removed and surfaces examined, particularly in case of new boilers, until proper intervals have been established by experience.

—All things about the boiler room should be kept clean and in good order. Negligence tends to waste and decay.

COLORS AND DYEING.

Dye Recipes for June.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 81.

Slate on Cotton Yarn.

Vidal Black on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

1 lb. Vidal Black.
(Sykes & Street, 85 Water St., New York.)

3 lbs. Carbonate of Soda.

25 lbs. Common Salt.

Enter in cotton at 150° F., give three turns without steam, raise temperature quickly to boil, turn one hour at a slow boil; then wash and give three turns at 150° F. in a bath of

2½ lbs. Oil of Vitriol.

2½ lbs. Bichromate of Potash.

Wash.

Vidal Black is an extremely fast color, and is well adapted for hosiery dyeing. It works perfectly even on the yarn or cloth, is easily and cheaply dyed, and will produce, with small amounts of color, some very fine shades of grays, slates, etc.

RECIPE NO. 82.

Pink on Cotton Yarn.

Pink on 100 lbs. unbleached cotton yarn:

Mordant the cotton with

2 lbs. Tanic Acid.

Then in

1 lb. Tartar Emetic.

Wash off and dye in a bath with:

½ lb. Rhodamine 5 G
(C. Bischoff & Co., 87 Park Place New York.)

Enter in yarn at 100° F.; bring temperature up to 140° while turning, and turn to shade at that heat.

A dark pink is shown above, with only 8 ounces of color, showing Rhodamine 5 G to be a very strong color, as well as a very fast one. This dye is largely used by silk and wool dyers, on account of the brilliant and rich shades produced. Its fastness is also considered to be very superior. (See Recipe 73.)

RECIPE NO. 83.

Medium Brown on Worsted Yarn.

Brown on 100 lbs. worsted yarn:

Prepare dye bath with

2 lbs. Anthracene Acid Brown R.
(Wm. J. Matheson & Co., Ltd., 178 Front St., New York.)

10 lbs. Glauber's Salt.

Enter yarn at 160° F.; bring to boil and turn at boil one hour; then add

4 lbs. Acetic Acid.

Turn 3-4 hour longer and add

¾ lb. Bichromate of Potash.

Turn 1-2 hour and wash.

Anthracene Acid Brown R is somewhat redder than the G. It is a very fast color, dyeing level, and does not rub off. (See Recipe 75 for a red brown from Anthracene Acid Brown G.)

RECIPE NO. 84.

Medium Blue on Cotton Yarn.

Blue on 100 lbs. unbleached cotton yarn:

Prepare dye bath with

3 lbs. Benzo Blue B X.
(Farbenfabriken of Elberfeld Co., 77 William St., New York.)

20 lbs. Common Salt.

1 lb. Sal Soda.

Enter in yarn at boil and turn one hour at that heat.

Benzo Blue B X dyes fine, bloomy shades of blue. The dye bath, on dark dyeings, is not exhausted, and can be retained for future dyeings, when equal shades can be obtained by adding less color to same bath. (See Recipe 79 for a light blue.)

RECIPE NO. 85.

Light Yellow on Cotton Plush.

Columbia Yellow on 100 lbs. cotton plush.

Prepare dye bath with

12 oz. Columbia Yellow.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
12 lbs. Salt.

Enter in yarn at boil, and turn one hour at that heat.

Columbia Yellow, being a new and cheap color, will no doubt be largely sought after by cotton dyers, on account of its strength and fastness, also for its good points in combining with other direct colors, and for its level dyeing.

RECIPE NO. 86.

Orange Yellow on Cotton Yarn.

Columbia Yellow on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

2¼ lbs. Columbia Yellow.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
30 lbs. Salt.

Enter in yarn at boil, and turn one hour at that heat.

Columbia Yellow, when dyed with from 2 1-2 to 3 per cent. of color, produces a full, dark and brilliant shade of yellow. The color is very soluble, and combines with other direct colors.

RECIPE NO. 87.

Dark Blue on Cotton Flannel.

Diphenyl Blue on 100 lbs. cotton flannel.

Prepare dye bath with

3 lbs. Diphenyl Blue.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Common Salt.
1 lb. Sal Soda.

Enter in yarn at boil, and run one hour at that heat.

Diphenyl Blue, like Diphenyl Black, is a very fast color, dyeing very level on the fibre. It is well adapted for piece goods, as well as for yarns, on account of going on the cloth slowly. (See Recipe 74.)

RECIPE NO. 88.

Black on Cotton Yarn.

Black on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

50 lbs. Logwood Liquor No. 65.
(Stamford Mfg. Co., 133 Front St., New York.)
6 lbs. Soda Ash.
5 lbs. Blue Stone.
6 lbs. Cutch.

Enter in yarn at boil, turn two hours at slow boil, lift out and let air while dyeing a second batch; then enter again and turn 1 1-2 hours at 180° F. Lift out and let cool, or age, two hours, and wash in cold bath of 1 lb. bichromate of potash. The above amount of dyestuff being for starting kettles, the amount can be reduced, as follows:

2nd kettle.

40 lbs. Logwood No. 65.
4 lbs. Soda Ash.
3 lbs. Blue Stone.
4 lbs. Cutch.

3rd kettle.

30 lbs. Logwood No. 65.
3 lbs. Soda Ash.
2 lbs. Blue Stone.
3 lbs. Cutch.

4th and standing kettle.

20 lbs. Logwood No. 65.
2 lbs. Soda Ash.
1½ lbs. Blue Stone.
3 lbs. Cutch.

Logwood Liquor No. 65 will be found by cotton dyers to be an excellent extract for dyeing one-dip blacks, on account of its cheapness. By rinsing the yarn off in a light chrome bath after dyeing, the color becomes darker and faster. (See Recipe 36, black on shoddy.)

RECIPE NO. 89.

Light Blue on Worsted Yarn.

Blue on 100 lbs. worsted yarn.

Prepare dye bath with

2½ oz. Anthracene Blue S.
(The Hanna-Schoellkopf Co., Philadelphia.)
10 lbs. Glauber's Salt.
1¾ lbs. Acetic Acid.

Enter in yarn at 60° F., bring to boil while turning, and turn one hour at that heat.

Anthracene Blue S. produces a fine, bright and fast shade of blue, working level on light shades. The color is very soluble.

RECIPE NO. 90.

Medium Blue on Worsted Yarn.

Blue on 100 lbs. worsted yarn.

Prepare dye bath with

2 lbs. Anthracene Blue S.
(The Hanna Schoellkopf Co., Philadelphia.)
10 lbs. Glauber's Salt.
2½ lbs. Acetic Acid.

Enter in yarn at 60° F. Bring to a boil while turning, and turn one hour at that heat.

Anthracene Blue S. dyes with 2 per cent color, a full, bright shade of blue, fast to fulling. It will combine with all anthracene colors sold by the same firm, in producing the various fast shades needed.

RECIPE NO. 91.

Red on Cotton Yarn.

Cardinal on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

1½ lbs. Benzo Purpurine, 10 B.
½ lb. Direct Orange.
3 lbs. Fankhausine.
(Nashoba Co., Ayer, Mass.)
10 lbs. Glauber's Salt.

Enter in yarn in dry state and turn 1 3-4 hours at boil; then shut off steam and turn 3-4 hour longer. Wash.

Fankhausine, when used as a mordant, with the direct colors, will save a great deal of time and money, as the yarn need not be boiled off before dyeing. It also acts as a mordant and makes the shade much cleaner and brighter. (See Recipes 12, 25, 39, 53 and 69.)

RECIPE NO. 92.

Medium Blue on Worsted Yarn.

Blue on 100 lbs. worsted yarn.

Prepare dye bath with

4 lbs. Dark Blue.
(Bosson & Lane, 36 Central Wharf, Boston.)
4 lbs. Oil of Vitriol.
10 lbs. Glauber's Salt.

Enter in yarn at 130° F. Bring temperature up to boil while turning, and turn to shade at that heat.

Dark Blue is a new color, and dyers will find it to produce a fine, deep indigo shade in one dip. It is a fast and clean color, exhausts the dye bath slowly, which results in even shades. It combines with other acid dyes, is easily dissolved, and is a cheap color to use.

RECIPE NO. 93.

Canary Yellow on Cotton Yarn.

Canary Yellow on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

5 ozs. Chrysophanine G.
(Victor Koechl & Co., 79 Murray St., New York.)
10 lbs. Common Salt.

Enter in yarn at 160° F., bring to boil while turning, and turn to shade at that heat.

Chrysophanine G. is a well known color among dyers. It is a very pure yellow, dyeing wool equally as well as cotton, and is a very fast color, dyeing a very fine, greenish shade of yellow. It is a very concentrated and pure color.

RECIPE NO. 94.

Golden Brown on Cotton Yarn.

Thio-Catechine on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

6 lbs. Thio-Catechine.
(Sykes & Street, 85 Water Street, New York.)
10 lbs. Common Salt.
10 lbs. Carbonate of Soda.

Enter in yarn at 140° F., and bring temperature up to 200° F.; turn at that heat one hour. Wash, lift out and turn 1-2 hour at 140° F. through a bath of

5 lbs. Bichromate of Potash.
5 lbs. Oil of Vitriol.

Wash and dry.

Thio-Catechine produces very fine cutch shades of browns and tans, all extra fast. When adding the dyestuff, it is better that it should be done in two separate portions. By fixing the color with blue-stone and oil of vitriol, a deeper shade of brown is produced. Thio-Catechine is well adapted for hosiery, on account of its fastness and cheapness. (See Recipe 66 for an orange.)

RECIPE NO. 95.

Slate on Cotton Yarn.

Light Slate on 100 lbs. unbleached cotton yarn.

Prepare dye bath with

4 ozs. Direct Black K.
(A. Klipstein & Co., 122 Pearl St., New York.)
8 lbs. Common Salt.
½ lb. Sal Soda.

Enter in yarn at 140° F.; bring to boil while turning, and turn one hour at that heat.

For dyeing silver gray, light or dark slates, Direct Black K. will be found to answer the purpose. The goods are quickly and evenly dyed. This dye will combine with other direct dyes for shading. (See Recipe 68.)

RECIPE NO. 96.

Brown on Cotton Flannel.

Brown on 100 lbs. cotton flannel.

Prepare dye bath with

1½ lbs. Diphenyl Brown.
(John J. Keller & Co., 104 Murray St., New York.)
20 lbs. Salt.

Enter in cloth at boil and turn one hour at that heat.

We show above a light shade of brown dyed with Diphenyl Brown. The color is fast and very soluble, dyeing slowly on the cloth. It will combine with Diphenyl Black for producing dark shades. (See Recipe 80.)

New Dyes.

We present in this issue's recipes, several dyes that have not appeared in these columns this year. For instance: In recipe 81, Vidal Black, furnished by Sykes & Street, New York, is used for the production of a desirable shade of slate on cotton yarn. It may be well to note in the use of this dye that no copper worms or utensils must be used, and the dyebath should be kept as short as possible, *i. e.*, not too diluted. The dye will be found fast to light, alkali and acid. We would suggest that hosiery and underwear manufacturers look into the merits of this dye for their wants.

In recipe 83, Anthracene Acid Brown R, furnished by William J. Matheson & Co., New York, is used for the production of a medium brown on worsted yarn. This dye, the same as the G brand, represents a class of dyestuffs that are absolutely fast to milling, and which possess extreme fastness to light, washing and acids. They are particularly well adapted for the dyeing of goods that are to be woven with white material, and then severely milled. This can be said most emphatically concerning the dye represented in this recipe.

In recipes 85 and 86, appears Columbia Yellow, furnished by the New York & Boston Dyewood Co., New York, used in different proportions for the production of two shades of yellow. Among the advantages of this dye, we may state that it is a most excellent article to be used in connection with various substantive dyes for discharge in printing with chloride of lime. Contrary to many other substantive yellows, this dye shows an absolute fastness against bleaching, and completely withstands the action of alkalies, acids and hot drying and calendering.

In recipes 89 and 90 are used Anthracene Blue S, furnished by the Hanna-Schoellkopf Co., Philadelphia. We call attention to our dyer's remarks in connection with the use of this dye, and particular attention to the results as they appear in our Dyers' Supplement.

In recipe 92, there appears a dye known as Dark Blue, furnished by Bosson & Lane, Boston. This is an acid color, and will be found quite fast to light and scouring. The comments by our dyer will be found of interest.

—For the production of logwood black, chromium and iron salts are employed as principal mordants, but aluminium, tin, and copper are frequently used as secondary mordants for the purpose of modifying the tone or the properties of the color.

Roundabout Notes.

Economizing indigo is always an important matter with the dyer, and a recent German patent seems worth the attention of indigo dyers. There is nothing new, however, in the main principle of the method, but some of the details seem to us to be fresh propositions. It was suggested some years ago that before entering the goods into the vat they should be printed with a fine network pattern of aniline black, and we have seen the method put into practice. The juxtaposition of the black with the indigo blue gives the appearance of a really good dark vat blue, and it would be a critical eye that could pick out any defects, even when compared side by side with a piece heavily dyed with pure indigo. The extension of the method suggests that a light vat blue should be printed with the hatch pattern in aniline black after dyeing, when a plain blue is required for a discharge style, and that for resists the printing should come first. At any rate a considerable saving in indigo is realized, and some good effects can be gotten.

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The chemists of the great firms of coal tar color manufacturers have two great duties almost equally important. The one is the superseding of old dyestuffs with new and better ones, and the other is the protection of methods of using old and approved dyes. The Farbenfabriken just lately have been giving very great attention to this latter department, and among other things they have discovered a very curious, improved method of using brilliant alizarine blue. The printers have complained that while the color has many virtues, it has the notable drawback of not steaming well. The Elberfeld firm now say that this may be completely remedied by the use of hyposulphite of soda. This cannot be added to the paste before it is sent out, but is added immediately before use to the usual acetate of chrome printing color; or better still, the cloth is passed through a bath of hyposulphite before printing.

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Cutch and gambier are very much alike, but still the chemist can distinguish between them. A writer in a German analytical paper suggests the following test: 3 grammes of the sample are dissolved in 25 c. c. normal caustic potash diluted with 100 c. c. of water; 50 c. c. benzene are added and the whole is shaken up in a test tube. On allowing to stand, the benzene separates from the rest, and if the sample is gambier it shows a green fluorescence. Cutch does not give this reaction.

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We noted in our last that a Manchester firm had put on the market a beta-naphthol absolutely free from alpha-naphthol. They now give the following test to discover the presence of alpha-naphthol in beta-naphthol. As this is of importance generally, especially in estimating the amount of alpha-naphthol present, we give it here: Dissolve in a small flask 2 grs. of beta-naphthol in 10 c. c. of alcohol, and add 5 c. c. of a 5 per cent. perchloride of iron solution. After two minutes standing, add 40 c. c. of water and shake well. A precipitate is formed, slightly green at first, which, if the sample be free from alpha-naphthol, turns white, and remains so on standing. The formation of a violet to blue color, on the contrary, announces the presence of a corresponding amount of alpha-naphthol. The test is so sharp that on a few hours' standing the presence of even 5 per cent. of impurity is easily detected. As the depth of the violet color corresponds with the amount of the alpha-compound in the sample, the method will serve for a quantitative estimation of the latter, if known quantities of the impurity are added to a pure product, until the mixture gives exactly the same depth of color as the sample in hand, always provided that

the same conditions are observed throughout.

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A new thickener for printing colors has been proposed in Germany. It is a solution of cellulose in chloride of zinc: 5 to 8 parts by weight of cellulose are impregnated with hydrochloric acid in a boiler provided with a steam coil. 100 parts of the concentrated solution of chloride of zinc are then stirred in, and the solution is effected by heat. The operation may be done the other way about, mixing the cellulose with the chloride of zinc to begin with, and adding the hydrochloric acid when the fibre commences to dissolve. In any case, when the solution is complete the excess of acid is neutralized with soda.

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Another method is to treat, for a few seconds, the cellulose, which may be ramie, hemp, linen or cotton, with the mixture of acids used in parchmenting paper, and then wash out the excess of acid before adding the chloride of zinc. If the acid is not sufficiently eliminated by this operation, it is indispensable to neutralize with soda. The solution obtained by either method may be used with all the mordants and colors ordinarily employed in printing. After printing or dyeing, the stuff is washed with clean water or in a sour bath to eliminate the excess of chloride of zinc. The cellulose and the other substances are fixed on the fibre and become insoluble. In some cases the printed piece is passed through a weak alkaline bath, or through an organic acid, such as tannic acid.

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A patentee has hit upon the idea that in waterproofing fabrics the composition, such as liquid celluloid, for instance, will adhere and keep on better, with less danger of cracking or peeling off, if the surface of the cloth is raised so that the small fibres become buried in the waterproofing material. He instances fustian as a suitable material, as it already has a pile. Undoubtedly he is quite correct in his views. There is no doubt that waterproof coating material would adhere better to the cloth on a raised surface, but the question is whether it is possible to patent such an invention. Fustian certainly has been waterproofed before now, and although it may be a new thing to point out that the raised surface is of some assistance, it is difficult to see how a patentee can prevent people still waterproofing goods which have been so treated since the process was first invented.

***

An improved composition for dressing fabrics of German origin consists of 15 pounds of chlorate of magnesium, 5 pounds of water and one pound of borax boiled together until they become a neutral solution; 17 pounds of starch and 5 pounds of rye flour are boiled in water and the two solutions are added together. When the composition has been brought to the consistence of a thin paste it is put into a cask for future use. The advantages claimed for the mixture are that the borax prevents the formation of hydrochloric acid, which is injurious to many colors, and that the rye flour prevents the absorption of damp, and keeps the chlorate of magnesium from crystallizing, while at the same time it prevents the cloth from being readily marked by folding.

Peroxide of Sodium.

We are in receipt of the advance sheets of a circular on bleaching with peroxide of sodium. This circular gives few lines descriptive of the old methods used, and a comparison with the modes de procedure as used hitherto. Under the title, "General Rules," appears a section on common sense in handling. To our mind the kindest thing that can be done is to place all people who use the peroxide on their guard—kind, both to the user and to the house manufacturing the article. Nothing can do so much hurt to the

new process and the excellent bleaching agent now brought forward, as to have a desperately bad fire break out with the peroxide as the cause. Now, although the peroxide has the power to bring about a large fire ("how large a matter a little fire kindleth"), we cannot argue that the chemical is to be unqualifiedly condemned. Quick lime is responsible for some loss; cotton is known as spontaneously combustible; sulphuric acid and the chlorates, and quite a number of other articles are potentially dangerous. Certainly it is a non-sequitur that because we read this morning that one chemist had an abominable explosion in his private laboratory, that therefore all chemistry is dangerous. Therefore, we think that a section on common sense in handling is most opportune. We hope it will be read. If we might be convinced this hope would be realized in moderate measure, we are confident that there would be no difficulty from fire. Very recently our chemist made an experiment in his laboratory, placing in a test tube a piece of paper and a small amount of peroxide; then a few drops of water were added, when the upper part of the paper took fire. This was a deliberate attempt to make a fire. The hazard does not exist when once the compound is in solution, of course, nor in presence of enough water to drown the heat.

It is largely the old story over again, of a new process and product in conflict with the old methods and prejudices. When speaking of peroxide as new, we do not mean an invention of yesterday, but as a process new in comparison to the present methods as they obtain to-day. There have been no changes in bleaching methods since the discovery of chloride of lime by Berthollet and its application by Tennant, before this century opened. The use of the rosin soap boil is an addition and not an alteration.

—In dyeing loose wool or yarn it is absolutely necessary, and in all cases it is desirable, that no solid particles should be present in the dye bath.

A New Chroming Bath.

My experience with a new chroming bath, may be of interest to some. Not long ago there was recommended to popular favor in the trade the idea of using muriatic acid, so called hydrochloric acid, with bichromate of potash or soda, in place of the customary red argols tartar, or "tartar substitute" and sulphuric acid as a mordant for wool. Chemically considered, the rationale of the process as it came to me, appeared to be quite sound and feasible. I could understand how resultant reduction would be apt to occur, and chromic acid become thereby liberated as with our usual assistants for that specific purpose; yet, I had my own misgivings as to its practical utility. As we were carrying over from one stock-taking to another in the mill, an abnormally large quantity of hydrochloric acid which some predecessor of mine had been obliged to take in without his seeing any prospect of possible use for in our business (where very seldom is it called into requisition for "spirits," or the like), it occured to me that a profitable way in which to work it up might be in connection with chrome in the manner indicated. Accordingly, I began a kettleful or two by way of experiment. The proportions given in the article I had read upon this subject were 1 per cent. of bichromate of potash ($N_2Cr_2O_7$),' to 3 1-2 per cent. of hydrochloric acid (H_1Cl); I decided therefore, to go by that for a beginning. I started with a couple of lots of two hundred and seventy-five pounds each, clean weight, intended for blue black. As a cheap, easy spinning shade of this was demanded, I had hitherto been treating these with eight pounds of chrome, five pounds of red argols and three pounds of sulphuric acid, finishing with one hundred and forty pounds of logwood chips (very dry), or two and a half pailsful of logwood extract, 51°. The first of these two lots I now gave three pounds of

chrome, and ten and a half pounds of muriatic acid. As I entered my wool in the preparation bath at about the ordinary temperature (160° Fah.), I found that I could scarcely get the mordant to work evenly on the stock, pole it as much as I might. I washed off the wool in the kettle, after boiling for an hour and a half, according to my ordinary practise, and passed it on then to the next bath of logwood. By the time it moved forward to the wool drier, I had made up my mind that some change from this procedure was advisable. The following lot, therefore, I gave five pounds of chrome and eighteen pounds of muriatic acid, and noticing that the bath at each chroming became clear or nearly so, denoting apparently that all the metallic oxide was deposited upon the wool, and as water in our place is a scarce commodity, and runs with aggravating leisure at that, I omitted the washing between the baths. The result was an evident improvement upon the initial batch; and I have been using up my old stock of hydrochloric acid in about the same way right along since. I may also note that I have likewise used it in mordant baths in which was a proportion of sulphate of copper (bluestone); also where in the finishing bath I made use of alizarine together with wood extracts. When my acid is used up I hardly expect to continue this method, however. If I should candidly sum up the conclusions of my own observation thus far, I confess that I can see no point of advantage in favor of the plan, excepting, indeed, that it were possible *and profitable* to use and reuse the chroming bath over and over again indefinitely for successive batches of stock. In such event I can see advantages that might reasonably be expected to accrue, but not otherwise. I find that I need to commence chroming (using hydrochloric acid as the assistant), at a temperature altogether too low for practical purposes; there is invariably quite a lot of trouble in getting the chrome fixed evenly, and after all there's no economy in money or time, in the new procedure. So much for our experience with the latest would-be rival to our staunch and trusty old friends of a generation. I am strongly reminded of a parallel experience two or three years ago with sulphuric acid as a fulling accessory to replace in part or completely our antiquated but proved and satisfactory soap of up-to-date efficiency. While it is always well to prove all things offered us on reasonable grounds, common sense demands that we hold fast that which is good, at least until we get something which is better or best and unmistakably so evidences itself. There has always been a happy "mejum" (as Samantha Allan might say) between the restless enterprise that spends its "time in nothing else but either to tell or to hear some new thing and forthwith to jump into practise of it; and the conservatism that maintains that the thing that hath been, it is that which shall be, and that which is done is that which shall be done, and there is no new thing under the sun."

J. C.

—A very simple experiment is sufficient to show that logwood in itself has practically no coloring power. If a piece of wool is boiled in a decoction of logwood in distilled water it acquires only a pale brown or drab color, which can be almost entirely removed by working in a weak soap bath; the wool is not dyed, but merely stained.

—Lactic acid is now obtainable as a cheap commercial product, and its introduction into the vat as lactate of lime, offers a ready way of either shortening the process by one stage, or at least of correcting irregularities, and of accelerating the course of events.

—In order to prepare extracts in which the coloring matter is in the same condition as in aged wood, the coloring matter should be very carefully oxidised after extraction and evaporation.

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Books on Cotton Spinning.

Editor Textile World:

Can you give me the names of some good books on cotton spinning, yarn calculations with yarn tables?

South Carolina. J. A. G.

(There are several good books covering the above subjects, all English publications, except the one issued by the Draper Co., Hopedale, Mass., being a catalogue of their manufactures, but containing many valuable tables. The following publications we can recommend: "The Student's Cotton Spinning," by Joseph Nasmith, price $3.00; "Cotton Spinning Calculations," by William H. Cook, a new work of 91 pages, price $1.00; "Handbook of Cotton Spinning," by J. E. Holme, published in 1887, 75 pages, price $1.00; "Cotton Spinning and Weaving," by H. E. Walmsley, 8 vo., 402 pages. This latter work, we should judge, would answer our correspondent's wishes better than anything else.)

Braid Finishing Machine.

Editor Textile World:

Will you kindly give us the addresses chines for sizing and finishing braided chines for sizing and finishing braided sash cord, and very much oblige

Cheraw, S. C. S. C. Braiding Co.

(We understand that the Rhode Island Braiding Machine Co., 228 Aborn St., Providence, R. I., are about building a finishing machine for sash cord and the like. It is not yet ready for the market. We do not know of any other concern making such a machine.)

Spinners and Weavers of Fine Yarns.

Editor Textile World:

Will you kindly furnish me, if not of too much trouble, with a list of the cotton mills spinning and weaving fine yarns? I mean those mills that comb and spin Sea Island and Egyptian cotton, either alone or mixed. X.

(In reply to this inquiry, we furnish the following list of mills in this country using combers, and their locations. We have possibly omitted some mills, but we think not: Bennett Mfg. Co., New Bedford, Mass.; Columbia Spinning Co., New Bedford, Mass.; Pierce Mfg. Co., New Bedford, Mass.; City Mfg. Co., New Bedford, Mass.; Potomska Mills, New Bedford, Mass.; Dartmouth Mfg. Corp., New Bedford, Mass.; Orswell Mills, Fitchburg, Mass.; William Clark Co., Westerly, R. I.; Lyman Mills, Holyoke, Mass.; Brighton Mills, New York City; Aldrich Mfg. Co., Providence, R. I.; Clark O. N. T. Thread Co., Newark, N. J.; Renfrew Mfg. Co., Adams, Mass.; Wamsutta Mills, New Bedford, Mass.; Grinnell Mfg. Co., New Bedford, Mass.; Hathaway Mfg. Co., New Bedford, Mass.; Acushnet Mills, New Bedford, Mass.; Cohannet Mills, Taunton, Mass.; King Philip Mills, Fall River, Mass.; Kerr Thread Co., Fall River, Mass.; Globe Yarn Mills, Fall River, Mass.; Merrimack Mfg. Co., Lowell, Mass.; Amoskeag Mfg. Co., Manchester, N. H.; J. & P. Coates Thread Co., Pawtucket, R. I.; Howland Mills, New Bedford, Mass.; Nemasket Mills, Taunton, Mass.; Barnaby Mfg. Co., Fall River, Mass.; Granite Mills, Fall River, Mass.; Hargraves Mills, Fall River, Mass.; Parker Mills, Fall River, Mass.; Otis Co., Ware, Mass.; Berkshire Mfg. Co., Adams, Mass.; Lawrence Mfg Co., Lowell, Mass.; Hadley Co., Holyoke, Mass.; Glasgo Yarn Mills, Glasgo, Conn.; Arlington Mills, Lawrence, Mass.; Green & Daniels Mfg. Co., Pawtucket, R. I.; Clark Mile End Spool Cotton Co., Newark, N. J.; Globe Mills, Woonsocket, R. I.; Berkley Mills, Berkley, R. I.; Skenandoa Cotton Co., Utica, N. Y.; Willimantic Linen Co., Willimantic, Ct.; Merrick Thread Co., Holyoke, Mass.; Floyd Cranska, Moosup, Ct.; Robert Beatty, Philadelphia, Pa.; Easthampton Spinning Co., Easthampton, Mass.; Ponemah Mills, Taftville, R. I.; Warren Mfg. Co., Warren, R. I.; Elizabeth Mills, Hills Grove, R. I.; Slater Cotton Co., Pawtucket, R. I.)

Maco Yarn and Hosiery Dyeing.

Editor Textile World:

Will you please give me the meaning of the term "Maco Yarn," which is used extensively by producers of high grade hosiery; also can you recommend to us a good, practical book on hosiery dyeing, both cotton and wool?

(Full information concerning Maco Yarn was given in our March number, page 98. There is no special work on hosiery dyeing. The most practical and up-to-time information is to be obtained in the Textile World and its Dyers' Supplement.)

Trade For Shuttle Blocks.

Editor Textile World:

We have an inquiry from a party for information as to the best way to reach foreign trade for logwood and persimmon shuttle blocks. He is desirous of knowing whether they are sold to shuttle manufacturers direct or through agents.

Philadelphia. E. P. A.

(J. Elwood Cox, High Point, N. C., furnish one or more of our New England shuttle manufacturers with a considerable amount of timber for shuttles, and does a large export business, mostly with Germany and England. He may be able to give the necessary information. We would further suggest correspondence with White, Child & Beney, Vienna, Austria, who handle shuttles and other mill supplies.)

Rollers for Spinning and Drawing Machines.

Editor Textile World:

I notice that you refer in your April number to a new kind of roller, intended to supersede leather covered rollers, for spinning and drawing machinery. Can you inform me where I can obtain a sample of this roller?

New York. M. E. S.

(This invention is an English one recently patented. We would advise our correspondent to address some of the foreign machinery agencies, whose advertisements appear in this magazine, as possibly one of them can obtain samples for him and satisfy his inquiries. We understand that the roller has been in use in the Briggella Mills, Little Horton, England. J. Briggs & Co., and the inventor (Richard Temmel, a Berlin engineer), are the owners of the patent rights, the idea having worked out to its practical success in the mills of Briggs, Posselt & Co., Warsaw. The establishment in Warsaw, with 50,000 spindles, has now been running for more than twelve months with the new roller. We might state that the roller is made of cork.)

Waste Wanted.

Editor Textile World:

We thank you for the specimen copy of your publication, which we very much like. Please add our name to the list of your subscribers, and find enclosed a check on London for £1 2s., for amount of subscription for two years, beginning with January number, and ending with December, 1898, including Directory of the Trade. Could you give us, as well, the names of some cotton waste merchants and manufacturers, as we are large buyers of waste for spinning ordinary counts up to 20s, and we want to buy a whole cargo of G. M. cotton, together with cheap cotton waste.

Thanking you in advance, we remain

San Sebastian, Spain. J. B. Co.

(The addresses of cotton waste merchants and manufacturers will be found in the Textile World's Directory of the Trade. At the present time, however, we do not think our Spanish correspondents can purchase desirable waste in any quantity in this market on advantageous terms. The market has lately been so active that most dealers and manufacturers are sold ahead on nearly all grades, and have nothing in any quantity to offer.)

Fibre Yarns.

Editor Textile World:

We enclose sample of fibre matting and cloth. Can you inform us if these fibre yarns can be bought of any fibre manufacturer? If so, where?

Mechanicville, N. Y. Analytical.

(The samples referred to are made from paper yarn, except in the case of the white sample, which has a cotton warp. These so-called "fibre" carpets are made by the Hodges Fibre Carpet Co., of Boston, Mass. They make the yarn and weave it. They sell no yarn, manufacturing only for their own use, nor do we know of any concern now making such yarn. The Hodges people claim there is no other. This paper yarn is made by cutting tissue paper, which is especially put up in the form of big rolls, and is run through a cutting machine specially built for the purpose, which consists of a number of circular disk knives, which cut the paper into strips about one-half inch, or perhaps less, in width. After passing through the knives, it is wound on a core, which is composed of sections equal in width to the strips of paper. When sufficient quantity has been wound on, the machine is stopped, and these sections are separated, each containing a narrow ribbon roll of paper. These rolls are then placed in a special twisting frame, and when twisted and treated with a preparation, it is ready for weaving. Besides being used for carpets, it has been also used for bonnet frames, tapes, braids, a certain class of trimmings, etc. We believe the Hodges people claim some patents on the process, but there is none on the cutting machine. We think it doubtful if their patents are broad enough to insure a monopoly of the business. There is another concern in Boston who went into the manufacture of this yarn for other purposes than carpets, but we believe they did not continue it, and we know that some weeks ago their machinery was for sale.)

Cotton Designing.

Editor Textile World:

I desire to obtain a good book on designing of fancy cotton fabrics. Will you recommend one or two?

Fall River, Mass. G. W. R.

(The best works on this subject are the following: "Jacquard Weaving and Designing," by T. F. Bell, published by Longmans, Green & Co., New York. This is an 8 vo. book of 300 pages, and costs

$3. It takes up everything relating to jacquard weaving, such as full-harness mountings, card cutting and lacing, gauze weave, lappets and swivels, etc. "Cotton Weaving and Designing," by John T. Taylor, published by the same concern; price $2.50. This is also an 8 vo. work of 288 pages, and treats of hand and power looms, dobbies, leno weaving, figure designs, etc.)

The Public Debt.

Editor Textile World:

Will you please give me in as concise a manner as possible the public debt of the United States, and of what it consists.

J. C.

(This query and answer should have appeared in a previous number. The debt of the United States, February 28, 1897 was as follows:

Interest-bearing debt	$847,364,950.00
Debt on which interest has ceased	1,358,210.26
Debt bearing no interest.....	376,714,549.14
	1,225,437,709.40
Certificates and Treasury notes offset by an equal amount of cash in the Treasury.....	606,977,573.00
Aggregate ot debt....	1,832,415,282.40

About 85 per cent. of the interest bearing debt bears 4 per cent. The interest bearing debt is made up as follows:

Funded loan of 1891	$ 25,364,500
Funded loan of 1907	559,639,600
Refunding certificates.....	45,450
Loan of 1904.....	100,000,000
Loan of 1925	162,315,400
	847,364,950

The debt bearing no interest is made up as follows:

United States notes.....	$346,681,016.00
Old demand notes.....	54,347.50
Natational-bank notes:	
Redemption account.....	25,089,944.50
Fractional currency	6,889,241.14
	376,714,549 14

Carpet Weaving by Power.

Editor Textile World:

Can you inform me when carpets were first manufactured in England?

Lawrence, Mass. T. B.

(The manufacture of carpets in England began in the early part of the 17th century, but as a manufacturing industry the beginning was about 1755, at Kidderminster. Brussels were made as early as 1750 at Wilton. Axminster carpets were made about 1755, receiving their name from the town of Axminster, in which they were first manufactured. This carpet, even at that time, was one of great beauty in design and colors. The oldest style of carpets made in England by power is the Kidderminster, better known as the ingrain carpet. Originally it was a two-ply cloth.)

Application for a Patent.

Editor Textile World:

What process should I have to go through in order to make application for a patent?

Framingham, Mass. W. H.

(In order to apply for a patent, a petition has to be sent to the Commissioner of Patents, also written specifications, drawings, where the case admits of them, an oath of invention, and payment of a fee of $15. Models or specimens are not now required to be filed with the application. The most important part of an application for a patent is the specification and claims, which the patentee should not attempt to make out for himself, but employ a patent solicitor. We would suggest that our correspondent write to the Patent Office, Washington, for the rules in practice at that office.)

New Publications.

THE PRINTING OF TEXTILE FABRICS. By C. F. Seymour Rothwell, Philadelphia; J. B. Lippincott Co.; 312 pages, 8 vo.; price, $6.50. This is a practical manual on the printing of cotton, wool, silk and half-silk fabrics, with plates, illustrations in the text, and specimens of printed fabrics. The work is a companion volume to the well-known "Manual of Dyeing," by Knecht, Rawson & Loewenthal. The work contains but little information of a purely chemical or theoretical character, as it has been covered by the 'Manual of Dyeing." The author has confined himself more to the practical side of the subject, and the processes and machinery described by him are principally those with which he has practical experience. The character of the work may be judged of by a notice of its contents, which include articles on the following subjects: Machinery Used in Textile Printing; Thickeners and Mordants; The Printing of Cotton Goods; The Steam Style; Colors Produced Directly on the Fibre; Padding Style; Resist and Discharge Style; The Printing of Compound Colorings; The Printing of Woolen Goods; The Printing of Silk Goods; Practical Recipes for Printing. To the printer of textile fabrics the work is of inestimable value.

THE LIVING AGE. Published by the Living Age Co., Boston. In entering its fifty-fourth year this magazine seems to have entered a new career of prosperity and popularity. Among the evidences of this is the opening of new departments which enable it to cover a much wider field than ever before. Its translations bring its readers into close touch with the leaders in thought and action of Continental Europe. Of the more notable articles which have appeared in recent issues may be mentioned "The Mission of Tennyson," by W. S. Lilly; "Henry Drummond," by W. Robertson Nicoll; "Fathers of Literary Impressionists;" "Gibbon's Autobiography," by Leslie Stephen; "France and Russia in China," by Holt S. Hallett; "Herbert Spencer and Lord Salisbury on Evolution," by the Duke of Argyle; "A Day of Celebration," by Walter Besant.

APPLETON'S POPULAR SCIENCE MONTHLY for June, 1897, published by D. Appleton & Co., New York; price $5.00 a year. This number contains several especially timely articles. "The Evolution of the Modern Heavy Gun," describes the wonderful advance made in this department during the last fifty years. "The Silent City of the Muir Glacier" is a sharp little article, giving another illustration of the ready gullibility of the average citizen. David A. Wells's series is represented this month by a chapter on the "Forms and Nomenclature of Taxation," in which he deals at some length with the relative value of the direct and indirect forms. "Suicide and the Environment" is a discussion of the causes for the increase of suicide during the last decade. The important series on "Racial Geography" shows that the notion of a single European or white race is untenable, and that there are evidences of three original and distinct types. Among other articles may be mentioned "Globe Lightning," "World's Geologists at St. Petersburg," "Woman Suffrage and Education," "The History of Alcohol," "The Public and its Public Libraries."

FUEL OIL APPLIANCES AND FURNACES. W. S. Rockwell & Co. (furnace engineers), 26 Cortlandt St., New York, have issued a catalogue of fuel oil appliances and furnaces, in which our readers should be interested. The catalogue is supplied with illustrations of appliances and furnaces in actual operation, most of them in many of the largest and best known manufacturing works in the United States and Canada, where they are doing satisfactory work. The use of oil as a fuel has advantages in the manufacture of many goods. This catalogue furnishes full particulars on this point.

CYANOLE EXTRA. INDIGO BLUE N. INDIGO BLUE S. G. N. Leopold Cassella & Co., represented by William J. Matheson & Co., Ltd., New York, have just issued a handsome color card showing these colors upon cashmere. The samples are beautifully arranged, and show very attractive shades in blues, olives, browns, grays, greens, etc.

WONDERLAND, FOR 1897. The Northern Pacific Railroad has issued a work by this title, which will be sent on the application of anyone with a remittance of six cents in stamps. It is a highly attractive pamphlet in the way of illustrations and typography. It is particularly valuable for use in public schools, to both teachers and scholars. The chapter on "The Great Northwest" is almost a compendium of that region in its historic, geographic and political economic treatment. The chapter on the "Yellowstone Park" mentions some features of this wonderland not usually noted in detail.

THE OFFICIAL MANUAL OF THE WOOLEN AND WORSTED OVERSEER'S ASSOCIATION. Published by the Association, of which John Mulrooney, Plymouth, Mass., is secretary. The manual gives a brief history of the association, its constitution and by-laws, and a revised list of its membership, with portraits and short sketches of a few of its members. It also contains a few tables, rules and formulae, compiled from standard works. The organization has been in existence for fourteen years. The object of the association is for the dissemination of knowledge pertaining to the growth and manufacture of wool. This manual is in 8 vo. form, containing 175 pages, and reflects much credit upon the committee that was charged with its editorial work. Some of its contributed articles have already excited public interest through previous publication, particularly the one on "Wool and its Relation to Manufacturing," by Edward Greaves. Among the leading contributions may be mentioned the following: "Principles of Finishing Woolens," "Wool Scouring and Dyeing," "Practical Suggestions on Finishing Woolens and Worsteds."

POWER TRANSMISSION APPLIANCES. This is the title of a catalogue issued by the Dodge Mfg. Co., Mishawaka, Ind. It is elaborately gotten up, consisting of 288 pages, profusely illustrated, showing power transmission appliances, such as wood split pulleys, with patent standardized bushing system, various systems of rope transmission, friction clutches, shafting, hangers, capillary and chain oiling journal boxes, bearings, grain elevator machinery, etc. The aim and efforts of this concern are constantly directed toward the perfecting of power transmitting machinery, and the advancement of the practice governing the usages of this very important branch of mechanics.

SUMMER EXCURSIONS. This is the title of a pamphlet of 98 pages issued by the Fitchburg Railroad Co., showing places of interest along the lines of its railway system. No pains or expense have been spared to make this an attractive publication, and one that will be of service to the tourist. The arrangement of the descriptive and hotel matter seems worthy of attention. The pamphlet can be obtained by addressing J. R. Watson, Gen. Pass. Agt., Fitchburg R. R., Boston, Mass.

TANNIN BROWN B. Manufactured by Leopold Cassella & Co., Wm. J. Matheson & Co., agents, New York. This is a small circular in pamphlet form, containing samples and description of this new basic dyestuff, which, in its properties, is analogous to the well-known Bismarck Browns, but has the additional advantage of giving a full, deep, dark brown shade. The new product will be found valuable, not only for direct dyeings, but for topping velveteens, etc.

Industrial News.

—We had the pleasure, a few days ago, of a visit from J. A. Willard, president of the Mankato Knitting Mills, Mankato, Minn., who was visiting the East on business.

—The commencement exercises of the Pennsylvania Museum and School of Industrial Art were held June 4th at the Broad St. theatre, Philadelphia. Dr. Nicholas M. Butler, of Columbia University, delivered the address, his subject being "The Modern Ideal in Education."

—The ideal lubricant for bicycles should not only lubricate the chain and sprockets, but the pivots or pins holding the links of the chain also. Lubricants made from Pure Flake Graphite are to be recommended for this purpose. Graphitoleo, made by Joseph Dixon Crucible Co., Jersey City, N. J., hits the case.

—The annual convention of the Southern Textile Manufacturers' Association will be held June 23rd. It is expected that about 100 delegates will be in the convention, which will be in session for two days. The association had a most successful meeting at Atlanta last year, terminating with a banquet.

—Bale, Stuart & Co., importers of spun silk, Tussah and cotton yarns, 455 Broome St., New York, are to retire from business in this country.

—John J. Keller & Co., importers and dealers in dyestuff, New York, have moved their Boston branch office from 153 Milk St. to 135 Pearl St.

—The textile exhibit to be held in Fall River in connection with the visit of the committee of South American business men will be continued for one week. The Casino has been hired, and after the first day of the exhibit will be thrown open to the public free. Invitations will be sent to business men of surrounding cities, and indications are that many men engaged in the textile trades elsewhere will attend.

—The Philadelphia Museums held their national opening June 1st, 2nd and 3rd. This also was the occasion of the first annual meeting of the international advisory board of this institution. A banquet was given on the evening of the 2nd at the Bourse.

—Out of the 38 Fall River mills, not including the private corporations and a half a dozen bleacheries, 15 mills have passed their quarterly dividend. In the February quarter, 12 passed. Two mills declared 3 per cent., three declared 2 per cent., eight declared 1 1-2 per cent., nine declared 1 per cent. Dividends declared this quarter make an average of .87 per cent. on a capital of $22,133,000, or a disbursement of $192,950, compared with $222,050 paid in the February quarter. The majority of the mills declaring dividends have not earned them, but have paid same out of surplus.

—An important consolidation in the machinery field is that of the Norrish Foundry & Machine Co., of Glenrock, Pa., and Burnham Bros., of York, Pa. The new firm will be Norrish, Burnham & Co., incorporated, of Glenrock, Pa., and their line will comprise the well-known Burnham turbines, roller mills and power transmitting machinery. Both firms are very favorably known to the trade, and the consolidation has the best wishes of a large clientage.

—The Penn Dye Works, Burton & Hulton, Philadelphia, recently removed their plant from Jefferson and Meadow Sts., Frankford, to Penn St. and Belfield Ave., Germantown. They have increased their facilities, and added to their business the specialty of fast black and fancy colors on hosiery. They are also much better prepared for dyeing webbing for sweaters, in all colors, which has become one of their important branches. The firm informs us that in yarn dyeing their business capacity is quite double what it formally was.

—R. D. Kirkland, who looks after the Philadelphia trade of the Holbrook Mfg. Co., N. Y., manufacturers of mill soaps, has established an office and headquarters in the Bourse Building, Room 439. He reports good prospects, and their usual run of orders.

—C. P. Brooks, director of the Lowell Textile School, has gone to Europe for the purpose of visiting the textile centres of England, France and Germany, and visiting some of the textile schools and manufacturing firms, and investigating some new branches of textile trade.

—The Berlin Iron Bridge Company, of East Berlin, Conn., are working full time, and report that spring business is opening up in quite a brisk manner. They have a large number of contracts on hand, including a water tower at No. Berwick, Me.; large school building at East Albany, N. Y.; steel framework for the Providence Institution for Savings, at Providence, R. I.; steel framework for the new Waterbury Savings Bank, at Waterbury, Ct., and one for the Acme Malleable Iron Works, Buffalo, N. Y., etc.

—The Howard & Bullough Machine Co., of Pawtucket, R. I., have received of late some large orders for machinery. Among them may be mentioned the following: Union Cotton Mfg. Co., Fall River., picking machines, revolving flat cards and drawing, frames; Edna Cotton Mills, Healdsville, N. C., finishing pickers; The John P. King Mfg. Co., Augusta, Ga., picking machinery, revolving flat cards and drawing frames; Raccoon Mfg. Co., Raccoon, Mills, Ga., electric stop motion drawing frames.

—E. Van Noorden & Co., of Boston, have the contract for putting in a fine dome skylight at the City Hospital, Boston, over the new surgical theatre operating room. The room, when completed, will be one of the finest and best lighted rooms for its purpose in the world.

—The Howard & Bullough Machine Co., Pawtucket, R. I., have been doubling up their present power plant and transferring several of their departments to their large extension which has been recently completed.

—Owing to the death of W. Hollister, the firm of Hollister Bros., 160 5th Ave., New York, has been terminated.

—In the death of Henry Matthes, founder of the Oakdale Dye Works, Philadelphia, which occurred March 30th, the dyeing industry lost a respected and useful member. Beginning his career in Germany, Mr. Matthes came to America in early life, and at once continued the dyeing business. The Oakdale Works, established by him, have been successfully managed by the founder and his sons for a number of years. These works operate mainly for the hosiery mills, originating fancy shades on hosiery and yarns, and hold a strong clientage among leading Philadelphia manufacturers. They continue under the proprietorship of John, Henry and Theodore Matthes, sons of the deceased, who have practically run the business of late years. Mr. Matthes has been an invalid for some time, with a complication of troubles, resulting in dropsy, to which he succumbed. He was 71 years of age at the time of his death.

—Among the courses offered to the students of the Philadelphia Textile School during the past season, and which will be continued next year, is one on patents and patent law, by Prof. Charles N. Butler, C. E., the importance of which to the young man who contemplates devoting himself to manufacture, can hardly be over-estimated. Prof. Butler's lectures necessarily deal quite exhaustively, not only with cases of law, but with the inventions themselves which have special reference to textile industry, have special referenec to textile industry, so that the student of this course incidentally becomes familiar with all sorts of recent discoveries and inventions.

—The case of John W. Dempsey vs. J. & J. Dobson, carpet manufacturers of Philadelphia, has been decided in favor of the defendants. This was a case in which the defendants were accused of retaining the color book and formulae of the plaintiff, against his protest, when the latter was in their employ in charge of their dyeing establishment. In the first trial the jury decided in favor of Mr. Dempsey, but upon an appeal which has just been decided, the court reversed the first decision on the ground that the plaintiff had not shown any pecuniary loss, or loss of opportunity for obtaining other employment by reason of the retention by the Dobsons of his color book, therefore, there was nothing upon which a jury could base a claim for damages. The case is an interesting one.

—Christopher P. Brooks, director of the Lowell Textile School, Lowell, Mass., has received a commission from the government as the representative of the United States at the international congress for technical education, to be held in London, from the 15th to the 18th inst.

—Among our new announcements for this month, we are pleased to direct attention to the card of Schneebeli, Townsend & Co., Nazareth, Pa. In the manufacture of edgings and insertions for the knitting trade, this firm enjoys a wide and enviable reputation. Their manufacturing facilities are extensive, and their productions always claim the respect and confidence of the trade. An attractive line of their samples are now being shown by their selling agents, Fleming & Chapin, 215 Church St., Philadelphia, Pa.

George Shimer & Son's New Plant.

Allusion has already been made in these columns to the spinning plant of Geo. Shimer & Son, Camden, N. J., which has been under construction for several months. We are pleased now to refer to their new mill, and direct attention to their announcement in our yarn department. A Textile World reporter recently inspected the plant, and found the general equipment quite as perfect as the firm had planned to make it. The main building is 53x154 feet, two stories, and the area is unbroken by partitions or columns. The room containing the drawing and spinning machinery, reels, etc., is abundantly lighted, and has the finest ventilation. The offices are handsomely appointed, and are located on the upper floor, commanding full view of the operating room. The spinning and drawing machinery was supplied by J. B. Farrar & Sons, Halifax, England, for whom Edw. Jefferson & Bro. are agents in Philadelphia. The reels are from Lindsay, Hyde & Co., Philadelphia, and the twisters were supplied by Collins Bros., Central Falls, while the Hoyt belting is used throughout, supplied by Jas. H. Billington & Co., Philadelphia. The entire machinery is new and of the latest type. Mr. Shimer informs us that no expense has been spared to equip their plant with the most modern and up-to-date machinery. The mill's production is worsted yarns for the weaving and knitting trade, in Nos. up to 40's, in two, three or four-ply, and all kinds of fancy yarns. Operation was begun June 1st, since which time inquiries and orders have been steadily received. The senior member of the firm is widely known throughout the yarn trade, having given a lifetime to the industry, and having been lately well known as a member of the firm of Shimer & Boyer. Mr. Shimer has followed the development of their new business with unceasing interest, and will give it the benefit of his advice and ripe experience, while the active management will devolve upon the son, Chas. R. Shimer, who is well experienced in yarn spinning, and possessed of a valuable business education. The Shimer Mills are located at 5th and Erie Sts., Camden, N. J., where for the present all business of the firm will be transacted. The question of a Philadelphia office, or the method of placing their output, has not yet been decided upon.

Vacation Convention of the American Institute of Instruction.

The members of that great educational organization, the American Institute of Instruction, are to be felicitated on the fact that their annual meeting is this year to be held in Montreal, the sessions to begin July 9 and continue till the 12th. For various reasons this is expected to be one of the most notable conventions ever held by the Institute. The program of the meeting itself will be interesting to all who are in sympathy with educational movements, and especially helpful to all grades of teachers and school officers. Special preparations for the accommodation of the visitors have been made by their Montreal entertainers and the committee in charge. The rates at the first-class hotels will be from $1.75 to $3.00 a day, and from $1.00 to $1.50 a day at private bording houses. The round trip excursion fare from Boston by any direct route will be $9.00, with correspondingly low rates from other New England points. Innumerable side trips from Montreal may be enjoyed, including excursions to the Ottawa River by rail and back by boat down the St. Lawrence and the famous Lachine Rapids for $1.00; to Quebec and return by rail $3.50, or one way by boat $5.00; and from Quebec to the picturesque Saguenay River by boat both ways, $4.00. Opportunities for independent side trips to the far-famed Thousand Islands, the city of Toronto, Niagara Falls and other noted places along the Canadian border will also be offered. Participation in all these reduced rates will be contingent on membership in the Institute. This costs only $1.00, and membership is not restricted to those who are actually connected with school work. Applications for board in Montreal may be sent to Mr. E. W. Arthy, superintendent of schools in that city, and for out of town accommodations to W. A. Kneeland, Montreal. Information regarding excursion tickets from Boston may be obtained at City Ticket Office, 322 Washington St., Union Station, and the principal offices on the Boston & Maine system. The tickets are good going July 5th to 9th and good returning July 12th to 31st. Stop-over privileges will be allowed at points north of Plymouth, White River Junction or North Conway.

The summer season is upon us and now comes the task of selecting the vacation grounds. New England in Maine, New Hampshire and Vermont has hundreds of resorts which are visited each year by multitudes of tourists and to these resorts, which include the Mountains, the Sea Shore and Lake regions, during the period from June 1st to September 30th the Boston & Maine Railroad will have on sale at all of its principal stations reduced rate round trip excursion tickets. This Company also issues an excursion book which is replete with information for tourists and travelers regarding routes and rates to all points in Northern New England; while a list of the leading hotels and boarding houses of this region is also included in this book, which is sent free to any address upon application to the General Passenger Department of the Boston & Maine Railroad, Boston.

—The Parks & Woolson Machine Co., Springfield, Vt., has recently received the following orders: Perseverance Worsted Co., Woonsocket, R. I., a worsted polishing machine; Firth & Foster Co., Providence Dye Works, Philadelphia, a measuring, rolling and doubling machine (this makes the fourth machine of the kind in use in this plant); and have placed with the Pontoosuc Woolen Mfg. Co., Pittsfield, Mass., a measuring, doubling and rolling machine; Holden, Leonard & Co., Bennington, Vt., a steam finishing machine; Conshohocken Woolen Co., West Conshohocken, Pa., a measuring, doubling and rolling machine; Granite Mills, St. Hyacinthe, P. Q., a steaming and stretching machine; Fulton Worsted Mills, Ful-

ton, N. Y., a 7/4 double shear, with list saving rests; Waterloo Knitting Co., Waterloo, N. Y., a 90-inch wire napper; Aetna Mills, Watertown, Mass., a steam finishing machine. The steam finishing machines of this company are growing in favor every day. Their double shears are meeting with great success.

Good Fishing in Maine.

In the wildest of the far reaching wilderness of Maine lies that widely and favorably known fishing ground, Moosehead Lake. It is a most beautiful body of water, and it is needless to mention that this lake offers an endless source of pleasure to tourists and sportsmen, but at this season of the year its beauties and charms and resources are of particular interest to the fisherman, for well he knows that the best and largest trout abound in its waters. Greenville is the point at the lower end of the lake at which the fisherman enters this region to seek one or another of the camps which is to be his temporary abiding place. It would seem that the days spent in such an isolated place would be dreary, but such is not the case, for the sport which attends the landing of a large and wary trout is fast and furious, and the day slips away only too soon. The evening likewise passes quickly, for stories of the experiences and expeditions of former years are related and compared, and almost before one is aware of the fact, it is late. To accommodate ever-increasing army of sportsmen, the Boston & Maine Railroad has arranged to place on sale at Boston and other principal points, reduced rate round-trip tickets to all of the leading fishing grounds of Maine. The car service from Boston is complete in every respect, and information regarding these fishing trips, together with descriptive books, can be obtained upon application to the General Passenger Department of the Boston & Maine Railroad, Boston, or at the Boston City Ticket Office, 322 Washington St., Boston, Mass.

The ice has long disappeared from the Adirondack lakes, and there is expected one of the most successful years in the history of these waters. It is a well-known fact that in no other lake in the Adirondacks is there so many large, speckled trout taken, as from Meacham Lake. It rivals the lakes of Maine, which for a long time bore off the palm in this direction, but in protecting the fry in years past, the size of the trout has been doubled. Upper Saranac Lake, N. Y., the shore fishing never was better than at present. Since the ice left the shores myriads of speckled trout have been seen, and the sport has been of the highest order. Excursion tickets to the Adirondacks are now on sale via the Fitchburg Railroad.

MILL NEWS.

Cotton.

New Mills.

—Canada, Montreal. It is being reported that the Montmorency Cotton Co., of Montreal, will erect a mill at Drummondsville to contain 1000 looms.

—Louisiana, New Orleans. Alonzo Valenzuela, of Spanish Honduras, has organized a company known as the American Cotton Mills & Commercial Co., Ltd. The company will have their headquarters in New Orleans. It holds the privilege from the Honduranean government of erecting cotton mills in Cortez. Cotton cloths will be manufactured. Machinery and material for the erection of the mill is now in New Orleans, from whence it will be shipped shortly.

—*Massachusetts, Fall River. The contract for supplying the machinery for the new Arkwright Mill, has been given to the following concerns: The pickers and openers will be supplied by the Kitson Machine Co., of Lowell; the cards, railway heads and drawing frames, by the Pettee Machine Co., of Newton Upper Falls; the speeders will come from the works of Brooks & Doxey, England; spinning frames by the Fales & Jenckes Co., of Pawtucket, R. I.; the looms, shafting, pulleys and hangers will be built by the Kilburn, Lincoln Co., of this city. There will be 300 27-inch looms; 300 34-inch and 300 40-inch. Later this number will be increased to a sufficient number to take care of the production of 50,000 spindles. The elevators will be supplied by the Covel Machine Co., of this city, and the boilers by Thayer & Co., of Boston.

—*Massachusetts, Fall River. A dispatch states that the contract for building the Arkwright Mill has been awarded to Chauncey H. Sears, of Providence, R. I., for $164,800.

—North Carolina, Charlotte. A building is being erected here for receiving the braiding machinery that will be removed from Cincinnati, O. The plant will be operated under the firm name of Somerville Braid & Tape Works.

—*North Carolina, Troy. Concerning the report that a new cotton mill will be erected at Troy, we find on investigation that the report, as we suspected, referred to the Smitherman Cotton Mills, which we reported proposed early in '96, and concerning which we have the following official information. As previously reported by us, S. J. Smitherman will be president, and A. W. E. Capel, treasurer of the company. The mill will be started with seven revolving flat top cards, 2080 spindles and 80 looms. Motive power will be steam. Plain 4-yard sheetings will be manufactured.

—*South Carolina, Graniteville. Work on the foundation for the Warren Co.'s new cotton mill has been commenced. The motive power of the mill will be steam.

—*South Carolina, Greenwood. The Grendel Cotton Mill is now nearing completion. The machinery will soon be in place and ready to have the power turned on.

—*Tennessee, Jonesboro. The placing of new machinery in the Jonesboro Cotton Mill is about completed, and the mill will be ready for operation in a few days.

Enlargements and Improvements.

—Alabama, Selma. The Selma Cotton Mills Co. authorize us to state that the reports that they will double the capacity of their mill in the near future are erroneous, as the mills will not be enlarged this year.

—Connecticut, Jewett City. 150 plain looms will be discarded at the Jewett City Cotton Mills, and an equal number of full Crompton fancies will be installed.

—*Georgia, Alice. We are informed that J. M. Tate, who recently purchased the Atherton Yarn mill at this place, will continue the same in operation, and that he is now installing 1000 new spindles.

—Massachusetts, Shirley. The Sampson Cordage Co. will erect a wooden storehouse, one (1) story, flat roof, 50 feet in width, and 85 feet in length.

—New York, Auburn. The Columbian Cordage Co. is building an addition in order that it may increase its production. A new office will also be built.

—North Carolina, Dallas. The Dallas Cotton Mills are putting in 56 new Lowell looms.

—North Carolina, Durham. Reports reach us that the Pearl Cotton Mill will be enlarged at an early date.

—North Carolina, Mount Holly. The Mount Holly Mills may be equipped with weaving machinery in the near future. At present it spins only.

—North Carolina, Roanoke Rapids It is reported that the Roanoke Mills Co. are thinking of increasing the capacity of its plant this year.

—South Carolina, Bath. The Aiken Mfg. Co., it is reported, has decided to enlarge its cotton mill by the addition of 12,000 spindles and 300 looms. This will give the mill 27,000 spindles and 712 looms. Work will be commenced at once.

Mills Starting Up.

—Alabama, Tuscaloosa. The J. Snow Hardware Co. has resumed operations in its rope and yarn mill.

—*Georgia, Toccoa. The Toccoa Cotton Mill has been started up under the supervision of C. E. Guild, of Gainsville. The mill contains 5000 spindles and 160 looms.

—Maine, Springvale. At the annual meeting of the Springvale Cotton Mill Co., recently held here, E. W. Holbrook was chosen chairman, and C. T. Corey, secretary. The Board of Directors elected as follows: E. W. Holbrook, E. C. Holbrook, C. T. Corey, Wellington Holbrook and J. O. Bloss. It is stated that Mr. Bloss, who has been treasurer of the company for the last ten years, is to retire, and that the Holbrooks are to have the active management of the mill, which has been closed for some time, and will soon start up, and a class of goods entirely different than what they have formerly made will be manufactured.

—Massachusetts, Holyoke. The Merrick Thread Co. has resumed operation on full time in all the departments of its mill.

—Massachusetts, Lawrence. The running time of the Everett Cotton Mills has been increased from 45 to 51 1-2 hours per week.

—Massachusetts, Lowell. The print works of the Merrimac Corporation have resumep operation after being closed down for two weeks for the purpose of stock-taking.

—Mexico, Queretaro. The Hercules Cotton Factories have resumed operations, after being entirely closed down for several months.

—New Jersey, Gloucester City. The Gloucester Gingham Mill has started up on full time.

—New York, Chadwicks. Chadwick's Mills Cotton Company is making preparations for resuming operations.

—*North Carolina, Charlotte. The new Louise yarn mill has been started up.

—Pennsylvania, Glen Riddle. The Samuel Riddle's Sons have commenced operations in full. Their mills have been shut down during the past year.

—Pennsylvania, Scranton The Scranton Lace Factory has resumed operations, after a complete shut down of six weeks. This is the first time for upwards of a year this mill has been run on full time.

—Rhode Island, Mapleville. We have a report that Joshua Perkins, who formerly operated the Nasonville Mill, has associated himself with several other parties to form a stock company to operate the Mapleville Mills, which are now idle.

Mills Shutting Down.

—Connecticut, Central Village. The Kirk Mills Co. have reduced their running schedule to four days a week.

—Georgia, Dennard. Dixon & Snipes, proprietors of the Houston Factory, have notified their operatives that their services will no longer be required, as they will close the factory at once. In connection with this, there is a report that it is quite probable that in the near future the mill will be operated by a stock company.

—Georgia, Savannah. We have the report that the Savannah Cotton Mill has shut down and that the directors have decided to offer the same for sale. Up to within three (3) years these mills paid good dividends, since that time they have paid none. The idea of issuing bonds to re-equip the property and continue operations has been considered, but that has finally been decided to be impracticable.

—Massachusetts, Chicopee. The running time of the Dwight Mfg. Co.'s mills will probably be reduced one-third, commencing Tuesday, June the 1st.

—Massachusetts, Lawrence. The Pemberton Co. has reduced the running time of its mill from 45 hours a week to 32 1 2 hours.

—Massachusetts, Wilkinsonville. The Sutton Mfg. Co.'s mill is to be closed indefinitely. The mill, which is owned by the Slater Mfg. Co., at Webster, gives employment to 150 operatives.

—New Hampshire, Greenville. The Columbia Company has reduced the running time of its mill to thirty hours per week.

—New Hampshire, Nashua. The Vale Mills are at present closed down.

—New Hampshire, Nashua. The Jackson and Nashua Mills have been closed the past week.

—New Hampshire, Somersworth. The Great Falls Cotton Mfg. Co. has announced that beginning June 1st. their mills will be run 48 hours a week until the surplus stock is disposed of.

—New York, Stuyvesant Falls. A despatch states that the Van Allen Cotton Mills are closed indefinitely. No cause assigned.

—North Carolina, Charlotte. At the convention of Cotton Yarn Manufacturers, held

here on the 15th of May, about 40 yarn mills were represented. An agreement was signed, by which a curtailment of production of 25 per cent. will be made in yarns below twenties. This reduction is to go into effect June the 15th, and will be continued for an indefinite length of time.

—North Carolina, Franklinville. The Franklinville Mfg. Co. has decided to reduce the running time of its mill, owing to there being no market at present for their goods.

—Rhode Island, Fiskville. The Fiskville Cotton Mill, owned by B. B. & R. Knight, of Providence, that we recently reported making preparations for running out the stock, has shut down entirely.

—South Carolina, Chester. The Catawba Spinning Mill Co. has decided to close down its mill for the present.

—Nova Scotia, Halifax. Notices have been posted at the Dartmouth Cordage Factory that it will shut down for an indefinite period, as soon as the orders now on hand are filled.

Woolen.

New Mills

—*Maine, Fairfield. Fires have been started under the boilers at the Fairfield Textile Mill for the first time. The goods from this mill will be labeled, Kennebec Worsted Mill, and that will be the name of the company.

—*Michigan, Mt. Pleasant. Joseph Ambler, whose woolen mill was burned at Allegan, April 9th, last, has purchased machinery for his new mill which he will locate in this place.

—Missouri, St. Louis. J. M. Friend, 1416 N. Newstead Ave., is interested in a woolen mill now being built near St. Louis, which is about ready for machinery. He wants to buy second-hand machinery in good order. A complete outfit for a two or four set mill on cassimeres and blankets. Correspondence is invited.

—New Hampshire, Goff's Falls. The new mill that is to be erected for the Devonshire Mills, will be 54x230 ft., three stories and a basement. It is the intention to have the mill ready for occupancy by the first of August. The greater part of the machinery in the old mill will be moved into the new building. They will probably purchase a small amount of new machinery.

—Pennsylvania, North Warren. The Hazeltine Woolen Mills Co. is rebuilding its mill that was destroyed by fire on April 13th last.

—*Pennsylvania, Philadelphia. The commission combing plant of T. W. Thomason, that we reported in our issue of March the 6th was being established at American and Diamond Sts., is now in full operation.

Enlargements and Improvements.

—Massachusetts, Hudson. The Hudson Worsted Co. is increasing its facilities for doing business by installing a considerable amount of new machinery.

—New Hampshire, Gonic. The Gonic Woolen Manufacturing Company is building a new brick dye house, 110x33 1-2 feet. It will be equipped with all the modern improvements.

—*New Hampshire, No. Salem. The worsted plant that we reported in January last would be installed for W. H. Hanson is now being started up, under the superintendency of Joshua Woodhead, of Lowell, Mass.

—Pennsylvania, Philadelphia. Moore & Bro., who recently sold their property at York and Sepviva Streets to the city, have rented part of Allen's mill on Howard St., where they will commence operations with twelve looms, which number will probably be doubled.

—Pennsylvania, Philadelphia. The Continental Carpet Mills on Front St. and Columbia Ave. have been leased to Thomas Caves & Son for one year. The company will continue to operate the Keystone Carpet Mill in conjunction with their new accession.

—Pennsylvania, Philadelphia. We are informed that Wm. H. Grundy & Co. contemplate building an addition to their worsted spinning plant.

—Pennsylvania, Philadelphia. W. T. Smith & Son are installing new looms at the Mascher and York Sts. mill for the weaving of art square carpets.

—Pennsylvania, Philadelphia. A one-story addition, to be used for a weaving shed, is being built to the Collingwood Mills, operated by Folwell & Bro.

—*Rhode Island, Bristol. The new addition that we recently reported was being built to the Cranston Worsted Mills, will be used for a combing shed. The present combing machinery, together with two additional new combs, will be installed therein. The company will also install one set of new worsted cards.

—Rhode Island, Pascoag. W. F. Slade & Co. are placing six Johnson & Bassett mules in their mills.

—Rhode Island, Pascoag. We have a report that Fred F. Arnold, the cotton yarn manufacturer, has leased twenty of the looms in the Sheffield Worsted Mills, which he will start in the manufacture of fancy worsteds.

Mills Starting Up.

—California, Santa Rosa. The Santa Rosa Woolen Mill has started up, after a long idleness.

—Connecticut, Hanover. Efforts are being made looking to a compromise by which the Allen Woolen Co., which suspended in '96, may be enabled to resume operation. Their mill has been idle for some time.

—Connecticut, Mystic. Mr. Alex Smith, who we reported had engaged the idle Greenmanville Mill, writes us that he has commenced the manufacture of goods; 5 sets of new woolen cards and 26 looms are being installed.

—Connecticut, Thompsonville. About 50 of the looms in the plant of the Hartford Carpet Co. are now being started up, and the mills will be run on three (3) days a week for the present.

—Indiana, Indianapolis. Geo. Merritt & Co. have resumed operations in their woolen mills, which have been idle for several weeks.

—Maine, South Berwick. The Newichawanick Mills, which have been idle since May 1st, for the purpose of placing a new water wheel, resumed operation on June 1st.

—Massachusetts, Cordaville. The Cordaville Woolen Company has started their mules on full time.

—Massachusetts, Dalton. The Hampton Woolen Co. will probably start its mill about the middle of June.

—Massachusetts, East Brookfield. Winfield Scott & Co. have commenced operations at the satinet mill formerly operated

by the Mann Bros. The company now has several improvements under consideration, one of which is the building of a brick addition on the north side of the mill.

—Massachusetts, Millville. Six (6) new looms have arrived here for the Ironstone Mill, which, it is said, will be operated by the owner, Albert Davis.

—Massachusetts, Palmer. Holden & Fuller's woolen mill has resumed operation on full time.

—*Minnesota, Rochester. The Rochester Woolen Mill Co. has its new mill in successful operation.

—*New Jersey, Camden. Geo. Shimer & Son have commenced operation in their new worsted spinning mill at 5th and Erie Sts.

—New York, Glenham. A report reaches us that a son of Judge Tilton, deceased, is at the head of a movement for starting up the old Tilton Mill, known as the Glenham Carpet Mills. This mill has been idle for several years, and the machinery was reported sold some time ago.

—New York, Utica. The Globe Woolen Mills are steadily increasing the number of its employees, which has now nearly reached its full number.

—New York, West Eaton. We have a report that a stock company has been formed to start the Cambria Woolen Mill in this place that was formerly operated by Lewis & Thomas.

—Pennsylvania, Philadelphia. The Pekin Mills, at Manayunk, formerly operated by Esterheld & Gallagher, will be started up by S. Taylor, of Canada.

—Pennsylvania, Philadelphia. Thomas Caves & Sons have purchased the tapestry department, comprising 47 looms, at the old Horner plant, from Joseph Bromley. This plant has been closed for some time.

—Rhode Island, Olneyville. L. W. Peckham, proprietor of the Morgan Mills and the Old Bay Mill, at Thornton, has leased the Brown Mill, in that village. His lease of the Bay Mill expired the first of June. The Brown Mill has not been in operation since Frank W. Tillinghast ceased to run it.

—Rhode Island, Pascoag. The Pascoag Worsted Mills, which have been idle a short time, owing to the death of Mrs. Magner, one of the owners, has resumed operations in full.

—*Rhode Island, Washington. Several looms have arrived for the Washington Mill, and more are expected in a few days. The mill will start with 40 looms; there will be some spinning, a twisting room and a dye house. A dynamo for lighting the mill will probably be introduced later on.

—Rhode Island, Wickford. The Wickford Woolen Mill, which is operated by Wm. Gregory, has been closed down the past week, but is expected to resume operations Tuesday morning, June 1st.

Mills Shutting Down.

—Massachusetts, Franklin. H. T. Hayward's mill is closed, and will probably remain so for a month at least.

—Massachusetts, Uxbridge. The Hecla Woolen Mill will run but five days per week for the present.

—New Hampshire, Hillsborough Bridge. The Hillsborough Woolen Mill Co. have reduced their running time 50 hours a week, until the business situation will warrant them to run on full time.

—Pennsylvania, Chester. The Arasapha Mfg. Co. has closed their mill for a short time.

—Vermont, No. Hartland. The Ottaquechee Woolen Co. has closed its mill on account of the dull market for woolen goods.

Knit.

New Mills.

—Georgia, Athens. James H. Dootson is thinking of engaging in the manufacture of knit underwear (shirts) and would be glad to hear from machine builders with reference to equipment, etc.

—Michigan, Muskegon. A report states that Louis P. Haight has purchased a factory at this place, and that he will begin the manufacture of underwear as soon as he can make arrangements for doing so. Mr. Haight was formerly superintendent of the Amazon Mills, and previous to that at Oneco, Ct.

—New Jersey, Swedesboro. Swedesboro citizens are endeavoring to interest capitalists of Philadelphia in a venture to erect a hosiery mill here.

—*Pennsylvania, Norristown. Rambo & Regar, proprietors of the Globe Knitting Mill at Walnut and Moore Sts., are said to be negotiating with Chas. Templeton, of the Norristown Oil Coth works, for the purchase of a tract of land adjoining his plant at Ford and Lafayette Sts. Should the deal be consumated, a large building will be erected on the site for the use of the firm.

—Pennsylvania, Oreland. We have a report that the firm of C. & G. Sasman, of Philadelphia, are erecting a hosiery mill at Oreland in which about forty hands are to be employed.

—*Pennsylvania, Philadelphia. The E. Sutro & Son Co. inform us that they expect to be located in their new plant that is now being erected at Thompson and Division Sts., about the first of October. The mill will be larger than the old one which the company have outgrown.

—South Carolina, Brunson. J. C. Preacher contemplates establishing a knitting mill in Brunson. He will be pleased to receive prices for machinery, supplies, etc.

—South Carolina, Hopkins. Arrangements are said to have been perfected for the starting of work on the new knitting mill to be built in this place by J. M. Graham, of Columbia. The mill will be operated in connection with his Columbia mill. The building will be of brick, with wood lining. The present intention is to confine the work entirely to the manufacture of hosiery, especially for children.

—Tennessee, Chattanooga. The Young Men's Business League is negotiating for the removal of a knitting mill from Pennsylvania to Chattanooga.

—*Texas, Fort Arthur. The Howard Cole Real Estate Co. inform us that they have not yet fully decided on building a knitting mill at Fort Arthur.

—Virginia, Lynchburg. The Lynchburg Industrial Association is endeavoring to secure a $20,000 knitting mill for this place.

Enlargements and Improvements.

—Michigan, Alma. H. W. Moore, who for

some time has leased the Alma Woolen Mills, has recently purchased the same. He will install new machinery for the manufacture of all classes of knit goods.

—*New Hampshire, Franklin Falls. Concerning the new mill that we recently reported would be erected for the Sulloway Mills, we have the following additional information. The company has decided to erect a new mill at a cost of about $150,000, for the purpose of manufacturing hosiery. Machinery will be purchased in Europe. The company turns in its present mill and an accumulated surplus. The remainder of the new stock was offered privately for subscription, and the amount required, about $85 000, was immediately taken. It is the intention to have the mill completed by autumn.

—New York, Hagaman's Mills. The capacity of the Anchor Mill, owned by L. E. Harrower, is being doubled by the addition of new machinery, etc. The mill, when running in full, will employ 200 hands.

—Pennsylvania, Royersford. The capacity of the Royersford Hosiery Mill, operated by Fritz & Krause, is being increased by the addition of new machinery.

—*Pennsylvania, Wisconisco. The enlargement that is being made to Kimmel & Mossop's hosiery mill will contain 50 new knitting machines, and give employment to 50 persons.

—Tennessee, Chattanooga. The Andrews Knitting Mill has been finally equipped with the extra machinery and appliances, and is being run to its fullest capacity.

Mills Starting Up.

—Massachusetts, Pittsfield. The D. M. Collins & Co. knitting mill has commenced running full time. It has been run on a reduced schedule for nearly one year.

—Massachusetts, Spencer. Work has been resumed in the Massasoit Knitting Mill. The mill has been idle for several weeks.

—New Hampshire, North Salem. It is said that A. Slack, of Lawrence, Mass., has purchased the Thomas Dustin plant, which has been idle since 1894, and that he will start the same on the manufacture of hair cloths.

—New York, Cohoes. The Royal Mill proprietors, Owen & Shaver, announce that they will soon start their novelty mill on full time.

—New York, Cohoes. The Continental Knitting Co. has started up in full.

—New York, Cohoes. The Royal Knitting Mill, owned by Shaver & Owen, is getting under way, and will be running in full soon.

—Pennsylvania, Birdsboro. The hosiery mills of Rambo & Regar, which shut down some time ago, owing to dullness of trade, has again resumed operations.

—Pennsylvania, Du Bois. We are informed that Harry Bush, of Jefferson County, is making investigations with the view of starting up the Du Bois Knitting Mill. This mill has been in liquidation for some time past.

—Pennsylvania, Macungie. Operations have been resumed in the knitting mill of R. F. Moyer & Co., after being closed down for several weeks in order to make some repairs on the boiler and engine.

—Pennsylvania, Reading. Nolde & Horst's new hosiery mill has been started up, and is now running in full.

—Rhode Island, Woonsocket. The Glenark Knitting Mill has reduced its running time to five days a week.

Mills Shutting Down.

—Massachusetts, Millbury. The Portsmouth Mill has reduced its running time to four days a week, owing to the dull state of the market for knit goods.

—New Jersey, Nutley. The Underhill Mfg. Co. has closed its mill, owing to a want of orders for its goods.

—New York, Cohoes. The Halcyon Mill is running on three-quarter time.

—New York, Cohoes. The Cascade Knitting Mill, owned by McDowell & Co., is being run but forty hours per week.

—New York, Cohoes. The Parsons Mfg. Co. is running its mill five days a week.

—New York, Cohoes. The Root Mfg. Co. is running its two mills on three-quarters time.

—New York, Cohoes. The Cascade Mill is running 40 hours a week.

—New York, Cohoes. The Cohoes Knitting Co.'s mill is being operated five days a week.

—New York, Cohoes. The Victor Knitting Mill has reduced its running time to five days a week.

—New York, Waterford. The Bishopton Knitting Mill, owned by Cavanaugh Brothers, is being operated but half time, and may be closed up entirely.

Silk.

New Mills.

—New Jersey, Hoboken. The Alliance Silk Mill Co., with a capital stock of $30,000, is a new concern that has just been incorporated here by Feodor Boas, of St. Hyacinthe, Que., Max Boronow, New York City, and Frank Maass, of Paterson. The company will operate a mill in West Hoboken.

—*Pennsylvania, Catasauqua. Harry G. Scheiden of Allentown, Pa., has secured the contract for the construction of the new silk mill that we reported would be erected on Race St., below Front, by G. D. Derry of New York City. The price to be paid for the construction of the building is $9,593.52. The work has already been begun. The contract calls for the completion of the mill in 90 days. It will be devoted principally for the weaving of broad silk, and will give employment to about 175 hands.

—*Pennsylvania, Columbia. Work has been started on the new four-story building that we reported in our issue of Jan. 9th would be erected for the Columbia Silk Company at this place.

—*Pennsylvania, Dorranceton. Messrs. Atwood & Sons, of Stonington, Conn., are interested in the New England Silk Mill that is projected for this place.

—*Pennsylvania, Marietta. The brick work on Marietta's new silk mill is rapidly going on. It will not be long before the mill will be ready to receive the machinery.

—Pennsylvania, Scranton. Levy Bros., of 71 Greene St., New York, also Paterson, N. J., are making arrangements for the purpose of establishing a silk ribbon mill in this city. Architect Cohen, of New York City, is making the plans.

—*Pennsylvania, Wilkesbarre. The Golden Rod Silk Mill Co., of Paterson, N. J.,

which, it will be recalled, wanted the local capitalists of Wilkesbarre to raise $150,000, they agreeing to put in $50,000, making a total of $200,000, for the purpose of building a silk mill in this city, finding that they could not secure that amount, have compromised the matter by accepting $50,000, the company to furnish a like amount. An application for a charter will be made as soon as possible. As previously reported, plans have already been prepared by an architect of Paterson, N. J. The bids for the construction of the plant will not be opened until the meeting of the stockholders, which will be held shortly. The mill will be erected opposite Surburban Park on the land of the North Park Land Co., on the D. & H. RR.

—Rhode Island, Pawtucket. We have received information that the Chardonnet Silk Syndicate is the name of a new concern that is being organized with a share capital of $5,000,000, for the purpose of controlling the American patents and rights of Count Hilair de Chardonnet's process for the manufacture of artificial silk, and all of its future improvements of the United States, and for the purpose of erecting a factory to manufacture the artificial silk yarn and providing the necessary working capital. Mr. F. C. Sayles, of Pawtucket, is the chairman of the syndicate committee, and there is said to be a good prospect that the plant will be located in this city.

Enlargements and Improvements.

—New Jersey, Lake View. Eastwood & White are building a two-story addition to their silk mill. The capacity of the plant will be nearly doubled.

—New Jersey, Paterson. J. B. Whitney has leased space in the old Grant Locomotive Works in this city, part of which he will occupy with his silk machinery. The plant will be increased to over 100 looms, which they expect to have running in a short time.

—New Jersey, Stirling. The Stirling Silk Mfg. Co. will, it is reported, increase their number of looms by the addition of fifty new ones.

Mills Shutting Down.

—Massachusetts, Canton. The three mills of the Eureka Silk Co. at this place are now being operated three-quarters time.

—New York, Long Island City. The Astoria Silk Works have shut down for the present.

Miscellaneous.

New Mills.

—Missouri, Rockville. James Closter-myer has his new flax mill in successful operation.

Enlargements and Improvements.

—Connecticut, Norwich. H. P. Cummings & Co., of Ware, Mass., are reported to have secured the contract for erecting a new building for the Norwich Bleachery.

—Massachusetts, Methuen. Report has it that an addition is to be built to the Methuen Company's mill occupied by the Tremont Worsted and Lawrence Knitting Companies. The new structure will be used by the Methuen Company for a dyehouse.

Mills Starting Up.

—Pennsylvania, Gloucester. The Gloucester Manufacturing Company, whose print works have been closed down for three weeks, is making preparations for resuming operations.

Fires.

—North Carolina, High Point. The Enterprise Cotton Mill was burned the 14th inst. The plant has not been in operation for some time. The fire was caused from spontaneous combustion.

—North Carolina, Monroe. The Monroe Cotton Mill recently sustained a loss of $1000 by fire.

—Pennsylvania, Spring City. The plant of the Perseverance Knitting Company was destroyed by fire on the 11th inst. The damage to the building, machinery and stock will amount to nearly $10,000. The fire is supposed to have been of incendiary origin. The loss is covered by an insurance of $12,500.

Failures and Suspensions.

—Massachusetts, Boston. Chamberlin Brothers & Company, wool merchants of this city, made an assignment on Thursday.

—Massachusets, Great Barrington. The Endrick Woolen Co., manufacturers of woolen goods at this place, is reported to have made an assignment to John Anderson, without preferences.

—Massachusetts, New Bedford. Morgan Rotch, president of the Howland, Rotch and New Bedford Cotton Mill Corporation, and one of the receivers of the three corporations, has assigned. Honorable Hosea M. Knowlton, Attorney General, is named as assignee. Mr. Rotch and his family were largely interested in the three corporations, as well as in other concerns, at home and elsewhere, which have lately met with reverses. The assignment conveys to Mr. Knowlton, for the benefit of creditors, all of Mr. Rotch's real estate and personal property. No specified schedule is filed, and no figures representing the assets and liabilities have been given out.

—Massachusetts, New Bedford. At a stockholders' meeting of the Lambeth Cotton Rope Co., the report of the committee and of the experts showed its affairs to be hopelessly involved, and there is practically no chance of its resurrection. A committee was appointed to petition the concern into insolvency, and wind it up.

—Massachusetts, New Bedford. The affairs of the Bennett and Columbia Corporations, according to the report of the receivers, show that both concerns are very badly off, for while the excess of assets over liabilities, not including capital stock, is $237 000 in the case of the Bennett, there is a $126,000 deficit in the Columbia. A detailed statement of the books and machinery estimate accompanies the report. The plant is now in operation, and the operatives have been paid their wages in arrears, and the pay roll is now being met each week. The accounts of the Columbia and Bennett mills have been separated and disentangled, and the receivers state that having reached this point, they will now be able to take up the task of reorganization of the properties. Such a plan has already been discussed, and they expect to submit it to the creditors within a short time. Arrangements have been perfected with Catlin & Co., the successors of O. H. Sampson & Co., to act as selling agents for the mill, and new orders are being received and executed.

—Ohio, Roscoe. W. H. Wilson, proprietor of the Roscoe Woolen Mill, is reported to have made an assignment for the benefit of his creditors, to Lewis D. Schott. His liabilities and assets are said to be about equal.

—Virginia, Petersburg. The Swift Creek Cotton Mills have been placed in the hands of a receiver. It is understood that efforts are being made to induce Northern capitalists to take charge of the indebtedness of the company, and take it out of the hands of the receiver. The receiver, W. Brydon Tennant, of Richmond, is reported as stating that the mills will continue to run, and that it is the intention to reorganize the company within the next three months, and that an effort will be made to liquidate the entire indebtedness of the company.

Facts and Gossip.

—Connecticut, Stafford Springs. Arnold & McKendrick, the card clothing manufacturers, have dissolved partnership. The business will be continued by Mr. Arnold.

—Connecticut, Willimantic. It is claimed that stockholders representing the majority of the stock of the Willimantic Linen Co. have agreed to sell their shares to an English syndicate. There are in all 80,000 shares of $25,000 each, representing a capital of $2,000,000.

—Georgia, Atlanta. The partnership of the firms of S. M. Inman & Co., of Atlanta, Ga.; Inman & Co., of Houston, Texas, and Inman, Sanders & Co., of Bremen, Germany, will expire by limitation September 1, 1897, and these firms will be dissolved by mutual consent. The good will of these firms will go by agreement to the firms of Sanders, Swann & Co., of Atlanta, Ga., and Bremen, Germany; Inman & Co., of Augusta, Ga., and Inman & Read, of Houston, Texas. The firm of Sanders, Swann & Co., of Atlanta, Ga., and Bremen, Germany, will be composed of W. C. Sanders, of Atlanta, Ga.; James Swann, of New York; John W. Sanders, of Bremen, Germany; Frank M. Inman and Inman H. Sanders, of Atlanta, Ga. The firm of Inman & Co., Augusta, Ga., will be composed of Wm. H. Inman, of Atlanta, Ga.; John W. Inman and J. F. McGowan, of Augusta, Ga. The firm of Inman & Read, of Houston, Texas, will be composed of S. M. Inman, of New York, and W. M. Read, of Houston, Texas, general partners, and Walker P. and Hugh T. Inman, of Atlanta, Ga., special partners.

—Kentucky, Owensboro. Richard Monarch has sold the Owensboro Woolen Mills to Hugh B. Phillips and Louis P. Birk for $35,000. The new owners will continue the mills in operation.

—Massachusetts, Attleboro. The Gold Medal Braid Company has been incorporated with a capital of $30,000. The officers are: Harvey Clapp, Attleboro Falls, president; H. F. Barrows, No. Attleboro, treasurer. This company manufactures cotton, worsted and silk braids.

—Massachusetts, Boston. The Canton Mfg. & Bleaching Co.'s Boston office is now at 78 Chauncy St., room 36. It was formerly at 109 High St.

—Massachusetts, Clinton. The J. B. Parker Machine Company's plant, recently advertised to be sold at public auction, has been purchased by the Clinton Wire cloth company, for the sum $4350, subject to a morigage of $15,000, and other claims aggregating $2900.

—Massachusetts, East Brookfield. The mill being operated by Mann & Stevens has been refitted throughout with first-class machinery, for the manufacture of satinets.

—Massachusetts, New Bedford. At a meeting of the creditors of the New Bedford Mfg. Co., held on Friday, the 4th inst., it was voted that a committee of five be chosen from the list of creditors, to consider the affairs of the corporation, and present a plan of operation in assuming the control of the property. It appears that there is a statute by which the creditors may organize themselves into a corporation to acquire the property of the old corporation; each creditor subscribing the amount of his claims instead of actual money. The nominating committee named as the committee of five: Walter Clifford, representing the National Bank of Commerce; Geo. Ripley, of Boston, representing the Hide & Leather Bank; Wm. H. Parker, of Lowell, representing the First National Bank; Gilbert Allen, representing the New Bedford Institute for Savings, and Walter P. Winsor, representing the First National Bank of New Bedford. The meeting adjourned subject to call.

—Massachusetts, New Bedford. The stockholders of the embarrassed Howland and Rotch Corporations have decided to reduce the old capital by a system of shrinkage, and then open new subscriptions for an increase back to the old figures. New subscription lists have already been opened, and of the $1,325,000 needed to recapitalize, $100,000 or more has already been paid in.

—Massachusetts, Wales. The placing of the follow attachments on the embarassed Excelsior Woolen Co., adds to the complication of their affairs: Taunton Dye Works & Bleachery Co., $500; Fred 'Hartley, $5000; R. B. Hawley, Jr., $5000, and the Garfield Woolen Co., $5000.

—New Jersey, Passaic. The Griffon! Company, that we reported organized at Paterson in February last, write us that it has located at Nos. 21-25 Central Avenue, Passaic, where it will operate 50 Knowles Gem looms, in the weaving of fine wool and worsted dress goods. The company has a capital of $25,000, and the officers are: Ernest F. Greeff, president; Emil Steinmann, treasurer, and Rudolph Kraft, agent. The plant will be operated by steam. All business communications should be addressed to the New York office, 106 Spring St.

—Pennsylvania, Philadelphia. Sam'l White will operate the rug looms in the Continental Mills at Front St. and Columbia Ave.

—Pennsylvania, Philadelphia. The Art Square Mfg. Co., recently incorporated, has succeeded to the business of A. G. Robertson, 2739 Fairhill St. The present capacity of the company is 5 looms, which number will probably be increased. Mr. Robertson will be the manager of the new company.

—Pennsylvania, Philadelphia. R. T. Foulk, manufacturer of ingrains and art squares, will remove from Allegheny and Kensington Aves., to Coral and Adams Sts., in the Arrott Mill.

—Pennsylvania, Scranton. Herbert W. Taylor, who in February last was appointed receiver of the Scranton Lace Curtain Mfg. Co., has filed his account, and asked to be discharged from the duties of receiver. The report has been conditionally confirmed by the court, which has also granted a rule to show cause why the receiver should not be discharged.

—Pennsylvania, Titusville. The Chas. Horn Silk Co., of this place, has been chartered with a capital stock of $60,000.

—Pennsylvania, Williamsport. The Woodrop & Welch Wool Co., with a capital of $25,000, has been chartered.

—Rhode Island, Bridgeton. Walter F. Slade & Co., of the Clear River Woolen Mill, at Burrillville, have received a discharge in insolvency. The firm is now free to enter business once more.

—*Rhode Island, Central Falls. Concerning the Rhode Island Spinning Co. that we reported would commence operations in the plant formerly operated by the Rhode Island Hosiery Co., that company informs us that they expect to start up about the 20th of this month. They will manufacture all kinds of woolen and merino yarns, and will also take some spinning on commission. They will commence operations with 2 sets of woolen cards.

—South Carolina, Lockhart. The Lockhart Mfg. Co. have issued a call for a special meeting of the stockholders to be held at the company's office on June the 9th, for the purpose of considering a proposition to increase the capital stock of the company from $500,000 to $650,000.

—South Carolina, Rock Hill. We are informed that the Standard Mills will not go into the hands of a receiver, as the application has been withdrawn. The mills are running steadily.

—Texas, Houston. Dorrance, Neville and Cairns is the style of a new cotton firm that has been organized to do business at Houston. The gentlemen composing the firm have been engaged in this business for several years. Mr. John M. Dorrance was formerly the junior member of the firm of W. Garrow & Co.; that partnership has been dissolved, and the business will be continued by Mr. Garrow, as heretofore. Mr. Geo. W. Neville has been with Ralli Bros. for the past 17 years, and Robt. C. Cairns has also been with the Ralli Bros. during the last three years.

—Vermont, Bennington. The Cooper Mfg. Co. deny the report that they will add a bleachery to their plant.

—West Virginia, Morgantown. The Morgantown Woolen Manufacturing Co. is hiring help for the purpose of operating their mill continuously night and day.

PERSONAL RECORD.

Cotton.

C. E. Guild, of Gainesville, Georgia, has been appointed superintendent of the Toccoa (Ga.) Cotton Mills.

Frank Towle, formerly overseer of carding in the Howland Mills, New Bedford, Mass., but more recently in a similar position with the Grant Yarn Mills, Fitchburg, Mass., has accepted a position with the Massachusetts Mills, at Lindale, Ga., where he will have charge of the carding department.

W. P. Woods has accepted the position of superintendent of the cotton department of the Jenckes Mfg. Co., Pawtucket, R. I. Mr. Woods formerly held a position as overseer in the King Philip Mills, Fall River, Mass.

Jos. Brady of the Fall River Manufacturing Company, has been engaged to overseer the weaving in the Richard Borden Mill at Fall River, Mass.

Robt. Wild, formerly with the Parker Mills, has been appointed overseer of weaving in the Nos. 2 and 3 Hargraves Mills, Fall River, Mass.

D. W. Bugbee has accepted a position as overseer of spinning in the Tremont & Suffolk Mills, Lowell, Mass.

W. M. Perry has accepted the position of overseer of carding in the J. R. Montgomery Co.'s No. 3 mill.

Jacob Bence has secured a position as section hand in the Warren Mills, Warren, Mass.

Charles Hill, of Wauregan, Conn., has resigned his position as overseer of the mule spinning rooms, after a service of thirty-four years.

Joseph Conn, for a number of years a second hand in the King Philip and Bourne Mills, Fall River, Mass., has accepted a position as overseer in a mill at Moosup, Conn.

Wm. H. Norris has accepted the position of superintendent with the Harden (N. C.) Cotton Mill. He was recently superintendent of the Mountain Island Cotton Mills, N. C.

John W. Powers, formerly of Readville and Oakdale, but more recently overseer of weaving for the Williamstown Mfg. Co., Williamstown, Mass., has accepted a similar position with the No. Pownal (N. H.) Mfg. Co.

John Schofield has resigned his position as superintendent with the Georgia Manufacturing Company, White Hall, Ga., on account of failing health.

Charles F. Smith, for the past four years overseer of carding at the Falls Mills, Norwich, Conn., is now superintendent with the Georgia Mfg. Co., White Hall, Ga.

O. H. Farr, formerly at Roswell, Ga., is now overseer of spinning for the Bibb Mfg. Co., Macon, Ga.

Harvey White, formerly of Lexington, N. C., but more recently at Graham, has been appointed superintendent of the Alamance Factory, Burlington, N. C.

Findley Smith has been promoted from second hand's position to that of overseer in the Altamahaw Mill, Greensboro, S. C.

W. H. Winn has resigned his position as overseer of dyeing at the Altamahaw Mill, and accepted a similar one in the Proximity Mills, Greensboro, N. C.

Allen J. Brown is now in charge of carding in the Clinton (S. C.) Cotton Mill. He was formerly at Newberry, S. C.

Thos. N. Lumley, formerly second hand at the Newberry (S. C.) Cotton Mill, has accepted a position as overseer of carding in the Vancluse (S. C.) Cotton Mill.

Martin Raidy has resigned his position as overseer of carding in the Renfrew Company's Broadley mill. He has held the position for 48 consecutive years. Failing eyesight caused him to resign.

John Rooney has been re-engaged as assistant superintendent of the Howland Mills, New Bedford, Mass.

Herbert E. Walmsley, for the past ten years agent of the Clark Thread Mills, of

Newark, N. J., has been appointed agent of the Wamsutta Mills, of New Bedford, Mass., to succeed the late William J. Kent.

Bartley Mellen of Lowell, Mass., is at present overseer of dyeing in the Magog Print Works, Magog, P. Q.

J. C. Reed, superintendent of the Altamahaw (N. C.) Cotton Mills, was formerly at Providence, R. I.

O. W. Stites, who recently resigned his position as superintendent of the No. Pownal (Vt.) Manufacturing Company, has accepted a similar position at Hoosic, N. Y.

G. W. McCombs has accepted a position as overseer of the cloth hall in the new Abbeville (S. C.) Cotton Mill. He was formerly in the Richland Mills, Columbia, S. C.

Henry A. Adams has accepted a position as second hand of the weaving department at the Troy Mills, of Fall River, Mass.; he recently held a similar position in the Hargraves Mills, in that city.

N. C. Brown is now overseer of weaving in the Pilot Cotton Mills, at Raleigh, N. C.

James M. Fraizer is overseer of the baling department in the Bibb Mfg. Co.'s mill, at Macon, Ga.

Henry Bartlett has been appointed overseer of spinning in the Manchester Mills, Macon, Ga.

D. N. Kirby, of the Newberry (S. C.) Mill, has been promoted from the picker room to the position of second hand in the card room.

Dick Ritch, of the Victor Cotton Mill, Charlotte, N. C., has recently been promoted from the position of second hand to that of overseer of the twisting department.

W. L. Smith has succeeded E. Lay as second hand of carding in the Victor Mill, Charlotte, N. C. Mr. Smith was formerly at Gastonia.

Geo. E. Hayes, recently superintendent of the Savannah Cotton Mills, at Savannah, Ga., is now at Lawrence, Mass.

Woolen.

Charles Davis, of Stafford Springs, Conn., has secured a position as second hand in the Northern Ohio Blanket Mills, Cleveland, Ohio.

Oscar E. Eckland, formerly of Pittsfield, Mass., is now in charge of a section at the Dundee Woolen Co.'s mill, Passaic, N. J.

James McDonald, of Ashaway, R. I., has accepted a position with the Westerly (R. I.) Woolen Company.

John W. England, who, during the past two years, has held a position as second hand in Geo. C. Moore's mill, No. Chelmsford, Mass., has accepted a position in the twisting department in a mill at Pittsfield, Mass.

E. J. Carvey has resigned his position as second hand in the card room of the Wanskuck Mill, Providence, R. I., and has accepted a similar one with the Rock Mfg. Co., Rockville, Conn.

Ernest Harrington is now second hand in the finishing department of the Oregon City Manufacturing Co.'s mill, at Oregon City, Oregon.

F. N. Freeland has secured a position as dresser tender in the Monongahela Textile Co.'s mill, at Morgantown, W. Va.

David Costine, for twent-five years second hand of carding in the Pontoosuc Mill, Pittsfield, Mass., has resigned.

Louis Mann has secured a position in the New England Co.'s mill at Rockville, Conn.

Geo. W. Taylor has accepted the position of superintendent of the Vasselboro Woolen Mills, Vasselboro, Maine. He was formerly superintendent for the Millbury Woolen Mills Co., at Millbury, Mass.

J. H. Loudon has resigned as superintendent of the Excelsior Woolen Mills, Wales, Mass., and will embark in business for himself at Norwalk, Conn.

On account of ill health Charles F. Monk, has resigned his position as overseer of spooling and dressing in the Pioneer Woolen Mill of Pittsfield, Maine. Mr. Monk had been in Pioneer Woolen Mill for 18 years.

Albert Sinclair has accepted the position of overseer of spooling and dressing in the Pioneer Woolen Mill at Pittsfield, Me.

O. F. Ireland has resigned as superintendent of the Old Kentucky Woolen Mills, Louisville, Ky., and will return East.

Wm. Murphy will have charge of spinning for the Windsor Falls Mfg. Co., at Adams, Mass.

J. G. Loughlin has accepted the position of overseer of dyeing at the Contrexville Plush Mill.

John J. Colt, formerly of Oak Valley, has been appointed to succeed George Saltonstall, as overseer of carding.

Henry Yarrington, recently with the Riverside Woolen Co., Lebanon, N. H., has resumed his former position as over-eer of finishing with the Mascoma Flannel Co.

Henry Anel, formerly of Mystic, Conn., is now with Edward Carpenter, Bridgewater, Vt., where he has charge of the finishing department.

Charles H. England has accepted a position as overseer of weaving for the Thomas Kent Manufacturing Co., of Clifton Heights, Penn. Mr. England has for some time past held a position at Rochdale, Mass.

C. Richmond, formerly of Fitchburg, Mass., has accepted the position of overseer of carding with the Clinton Worsted Company, of Clinton, Mass.

Edward Obershaw has resigned his position as overseer of carding for the Clinton (Mass.) Worsted Company.

H. E. Sykes has been appointed superintendent of the Passaic Woolen Company, Passaic, N. J. He formerly held a like position with the Globe Woolen Mills, Montreal, Canada.

Richard Greaves, of the Mallison Mills, Chester, Penn., has accepted a position as overseer of dyeing for the Beaver Dam Worsted Company, Beaver Dam, Wis.

Walter Fieldhouse has accepted a position as superintendent of the Old Kentucky Woolen Mills, Louisville, Ky. He was formerly superintendent for the Jacksonville Woolen Mills Company.

Frank Durkin, formerly overseer of weaving at the Lapham Mills, has accepted the position of superintendent and designer at the Excelsior Mills, Wales, Mass.

Ernest Trumpoldt, of Lawrence, Mass., has accepted a position as overseer of finishing in the Franklin Mills, at Franklin Falls, N. H.

Alizarine Black

(PATENTED)

Distinguished from all other blacks by the acid test . . .

It is an acknowledged fact that woolen goods for men's wear of American manufacture, due to the more general use of Alizarine Dyes (including the Alizarine Black), are faster in color and therefore give better service to the public than the foreign goods. This is of special importance in view of the fact that our climate with the clear skies and bright sunshine is more trying to colors than in England, Germany or France

Wm. Pickhardt & Kuttroff

NEW YORK

George W. C Dowding has been selected to succeed Edward P. Woodward as overseer of weaving at the Hockanum Mill, Rockville, Conn.

W. F. Shaw, of New London, Conn., has accepted the position of assistant superintendent at No. Vassalboro, Me.

Knit.

Otto Philips has resigned his position as overseer of dyeing for the Glastonbury Knitting Company, of Addison, Conn., and has accepted the superintendency of a dye house for a Boston (Mass.) company.

Fred Zee, formerly with the Atlantic Knitting Mills, of Cohoes, N. Y., is now with the Halcyon Mills, of that place, where he holds the position of overseer of carding.

G. H. Coburn has resigned his position as superintendent for A. P. Olzendam, at Manchester, N. H., having been chosen to succeed Michael Duffy as superintendent for Walter Aiken's Sons, at Franklin Falls.

M. W. Brooks, superintendent of the New Britain (Conn.) Knitting Company, has tendered his resignation in order to accept the position of superintendent with the Plainville Manufacturing Company, Plainville, Ct.

Adam McClelland has accepted a position as overseer of the cutting department of the Riverside Mill, Cohoes, N. Y.

Marriages.

Mr. Edward J. Nolan, of the silk manufacturing firm of Collinge, Nolan & Co., whose mills are located at Hagerstown, Maryland, and Paterson, New Jersey, was recently united in marriage to Miss Emily J. Parker, of Paterson.

Deaths.

Alfred Magnall, Fall River, Mass. Deceased was overseer of mule spinning in the Border City Mills for many years.

Charles Patrick Keon, at his residence, 44 Cedar Ave., Allegheny, Penn. Mr. Keon was a well known traveling salesman of fine linens.

Daniel Curry, 42, overseer of the picking department in Faulkner's Mill.

John W. Campbell, aged 30, yard master at Robert Bleakie & Co.'s woolen mill at Hyde Park, Mass.

Josiah T. Colony, a retired manufacturer of Keene, N. H.

Brigadier-General John G. Hazard, at his place of residence, Benefit and Waterman Sts., Providence, R. I. Deceased was a veteran of the war, and was well known in manufacturing circles, having for a long time, prior to 1880, been engaged in the cotton business, with headquarters at New Orleans, La.

A. M. Spaulding, overseer of finishing for the Brown Mfg. Co., Dover, Me.

Peter Williams, woolen merchant at 104 Chauncy St., Boston, Mass. When a boy, deceased worked in the Vassalboro Woolen Mills, at North Vassalboro, Me.

BUYERS' INDEX.

Advertisers whose names do not appear under desired headings will please notify the publishers. Such omissions are accidental, not intentional.

Alphabetical Index to Advertisements follows this Classified List.

Architects and Mill Engineers.
Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Automatic Boiler Feeds.
D'Este & Seeley Co, 29 Haverhill St, Boston

Balling Machine.
Torrance Mfg. Co, 18 Davis St, E. Newark N. J.

Bandings.
See under Yarns.

Belting.
Alexander Bros., 410 No. 3d St., Phila., Pa.
Danforth Belting Co, 221 Chestnut St, Phila, Pa.
Fell, Geo. & Son, Bolton, England.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
See also Mill Supplies.

Belt Dressing.
Alexander Bros, 410 No. 3d St, Phila, Pa.
Danforth Belting Co, 221 Chestnut St, Philadelphia, Pa.

Bindings.
See Tapes and Braids.

Bleaching Materials.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Bobbin Covers.
Hegeman, John, Amsterdam, N. Y.

Bobbins, Spools, Shuttles, Etc.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Woonsocket Shuttle Co, Woonsocket, R. I.

Boiler Compounds.
Imperial Chemical Co, 432 Market St, Phila, Pa.
Lord, G. W, 316 Union St, Phila, Pa.

Boxes, Paper.
Palmer, J. S, 35 Wistar St, Germantown, Pa.

Boxes, Cloth Boards, Etc.
Pearson, J. T, Kensington, Pa.
Thompson, Snow & Co, Greenfield, Mass.

Braids.
See Tapes and Braids.

Braiding Machines.
Thun & Janssen, Reading, Pa.

Burr Pickers.
Atlas Mfg. Co., Newark, N. J.
Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

Business and Financial Brokers.
Riggs & Company, 573 Bourse, Philadelphia.

Card Clothing.
Ashworth, Elijah, Fall Biver, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

Card Feeds.
Atlas Mfg. Co , Newark, N. J.
Kitson Machine Co, Lowell, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Calico Printers' Machinery and Supplies.
New Bedford Copper Co, New Bedford, Mass.
See also Dyeing, Bleaching Machinery, etc.

Carders' Tools.
Brown, W. H, Mechanic St, Worcester, Mass.

Carpet Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Ms.
Furbush, M. A, & Son, Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.

Chemicals.
De Ronde, A, & Co, 254 Front St, New York.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.

Chemist.
Huntington, Dr. H, 159 Front St, New York.

Copper Print Rollers.
New Bedford Copper Co, New Bedford, Mass.

Copper Work for Dyers.
Brabender, Chas, Sr, Paterson, N. J.
Oat, Jos. & Sons, 232 Quarry St, Phila, Pa.

Cotton Machinery.
Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Atherton Machine Co, Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester Mass.
Draper Company, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Fairmount Machine Co, 22d and Wood Sts, Philadelphia.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kilburn, Lincoln & Co, Fall River, Mass.
Kitson Machine Co, Lowell, Mass.
Leigh, Evan A, 35 Mason Building, Boston.
Lowell Machine Shop, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Mason Machine Works, Taunton, Mass.
Saco Water Power Machine Shop, Biddeford, Me.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
Whitin Machine Wks, Whitinsville, Mass.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Cotton Openers and Lappers.
Atherton Machine Co, Lowell, Mass.
Howard & Bullough American Machine Co, Pawtucket, R. I.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.

Cotton Webbing.
Witter, H. M, & Co, Worcester, Mass.

Cutters for Knit Fabrics.
Kennedy, Thos. (Cutters, etc.,) Cohoes, N. Y.

Damper Regulators.
D'Este & Seeley Co. (Curtis), 29 Haverhill St, Boston, Mass.

Designers.
Fresnel, Gustave, 125 W. 56th St, N. Y.
Hand, F, & Co, Paterson, N. J.

Dryers.
Philadelphia Textile Machinery Co, Philadelphia, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Dusters.

See Wool and Waste Dusters.

Dyeing, Bleaching and Finishing.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket and Valley Falls, R. I.
Kensington Dye Works, Kensington, Pa.
Warren, W, Thread Works, Westfield, Mass.

Dyeing, Drying, Bleaching and Finishing Machinery.

Birch Bros., Somerville, Mass.
Butterworth, H. W, & Sons Co, Phila, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Co, 22 and Wood Sts, Philadelphia.
Granger Foundry & Machine Co, Providence, R. I.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Lincoln & Co, 54 Arch St, Hartford, Ct.
Parks & Woolson Machine Co, Springfield, Vt.
Phenix Iron Foundry, P ovidence, R. I.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass. (Drying.)
Woonsocket Machine & Press Co, Woonsocket, R. I.

Dye Sticks,

Haedrich, E. M, 311 1-2 Walnut St, Phila, Pa.

Dyestuffs and Chemicals.

Anchor Color Mfg. Co, 464 Cherry St, New York.
Ashley, T. C, & Co, 145 Milk St, Boston.
Atteaux, F. E, & Co, 172 Purchase St, Boston, Mass.
Beach & Co, Hartford, Ct.
Bischoff, & Co, 87 Park Place, N. Y.
Bosson & Lane, 36 Central Wharf, Boston.
Bullock & Crenshaw, 528 Arch St, Phila, Pa.
Corey, S. J, 273 Congress St, Boston.
De Ronde, A, & Co, 254 Front St, New York.
Farbenfabriken of Elberfeld Co, 77 William St, N. Y.
Geisenheimer & Co, 189 Front St, New York.
Hanna-Schoellkopf Co, Philadelphia, Pa.
Harway Dyewood & Extract Mfg. Co, 184 Front St, N. Y.
Innis & Co, 120 William St, New York.
Jaeck Bros, J, 62-68 No. 11th St, Brooklyn, N. Y.
Janney, O. S, & Co, Phila. and Boston.
Johnson, Chas. A, & Co, 22 Dey St, N. Y.
Johnson, Wm. G, & Co, Uncasville, Conn.
Kalbfleisch, Franklin H, Co, New York.
Kalle & Co., 77 John St., N. Y.
Keller, John J, & Co, 104-106 Murray St, N. Y.
Klipstein, A, & Co, 122 Pearl St, N. Y.
Koechl, Victor, & Co, 79 Murray St., N. Y.
Matheson, W. J, & Co, 178 Front St, N. Y.
Merrimac Chemical Co, Boston, Mass.
Nashoba Co, Ayer, Mass.
N. Y. & Boston Dyewood Co, 55 Beekman St, New York.
Oakes Mfg. Co, 93 Pearl St, N. Y.
Phillips (Moro) Chemical Co, 131 S. 3d St, Phila., Pa.
Pickhardt & Kuttroff, New York.
Polhemus, Henry, 66 Maiden Lane, N. Y.
Roessler & Hasslacher Chemical Co, 73 Pine St, New York.
Sharpless Dye Wood Ext. Co, 22 N. Front St, Phila, Pa.
Stamford Mfg. Co, 157 Maiden Lane, N. Y.
Stone & Ware Co, The, 157 Maiden Lane, N. Y.
Sykes & Street, 85 Water St, N. Y.

Dyers and Finishers.

Bay State Dyeing & Finishing Co, North Andover Depot, Mass.
Boston Finishing Works, Williamstown Mass.
Cranston Worsted Mills (yarns), Bristol R. I.
Firth & Foster Co, Kensington, Pa.
Greenwood, R, & Bault, Frankford, Pa.
Home Bleach & Dye Works, Pawtucket, R. I.
Kensington Dye Works, Kensington, Pa.
Oakdale Dye Works, 915 W. York St, Phila, Pa.
Pawtucket Dyeing & Bleaching Co, Pawtucket, R. I.
Warren, W, Thread Works, Westfield, Mass.

Dyers' Clogs.

Wildman, Jos, & Co, 1908 N. Front St, Phila.

Edgings.

See Tapes, Braids and Edgings.

Electrotyping and Printing.

J. J. Ryder & Co, 210 Westminster St, Providence, R. I.
Whitcomb, H. C, & Co, Boston.

Elevators.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Salem Foundry & Machine Shop, Salem, Mass.

Engineers, Electrical.

Smeallie Bros, Amsterdam, N. Y.

Engineers, Mechanical.

Berlin Iron Bridge Co, E. Berlin, Ct.
Ferguson, John W, Paterson, N. J.
Smeallie Bros, Amsterdam, N. Y.

Engraving on Wood.

Ryder Co, J. J, 210 Westminster St, Providence, R. I.

Express Money Orders and Travelers' Cheques.

American Express Co, offices in every city

Factory Sites.

Dolge, Alfred, Dolgeville, N. Y.

Feed Water Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Phœnix Iron Foundry, Providence, R. I.
Smeallie Bros, Amsterdam, N. Y.

Finishing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Fluted Rolls.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Fuel Oil Furnaces.

Rockwell, W. S, & Co, 27 Cortland St, N. Y.

Fulling Mills for Knit Goods.

Scott, H. W, Bennington, Vt.

Fulling Mills for Woolen Goods.

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter Jas, Machine Co, No. Adams, Mass.

Gas Singeing Machines.

Curtis & Marble Machine Co, Worcester, Ms.
Rockwell, W. S. & Co, 26 Cortlandt St, N. Y.

Gear Cutting Machine.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Harness Varnish.

D. L. Witmer & Bro, 5th St. and Germantown Ave, Philadelphia.

Heating.

See Ventilating.

Heddles.

Watson, L. S, Mfg. Co, Leicester, Mass.

Hosiery Boards.

Pearson, J. T, Kensington, Pa.

Index.

Burr Index Co, 336 Asylum St, Hartford, Conn.

Ink, Stamping.

Witmer, D. L, & Bro, 5th St. and Germantown Ave, Philadelphia.

Insurance (Employers' Liability).

Employers' Liability Assurance Co, 28 Central St, Boston, Mass.

Knit Goods Edgings, Trimmings, etc.

Byram, F. A, Germantown, Pa.
Cheney Bros, Silk Goods, 479 Broome St, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Friedberger, Edgings, Germantown, Phila, Pa.

Hepner & Horwitz, Lacings, 30 Howard St, N. Y.
Krout & Fite Mfg. Co, 2632 Mascher St, Phila.
Schneebeli, Townsend & Co, Nazareth, Pa.
Weimar Bros, cor. Hope and Huntingdon Sts, Philadelphia.

Knit Goods Finishing Machines, Crochet, Etc.

Champion Sewing Machine Co, 1819 N. 5th St, Phila, Pa.
Merrow Machine Co, The, Hartford, Conn.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Von Buchwald, W. C, 120 N. 7th St, Philadelphia, Pa.

Knitting Machine Cylinders.

Ashman, Stephen A, 3 Fetter Lane, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Stafford, W, & Co, Little Falls, N. Y.
Stanton & Lewis, 318 Branch St, Phila, Pa.

Knitting Machinery.

Ardrey, S. B, & Sons, Bristol, Pa.
Bohm, Albert, Agt. for R. Stahl, Germany, 114 Nassau St, New York.
Boss Knitting Machine Co, 7th and Walnut Sts, Reading, Pa.
Brinton, H, & Co, 213 Race St, Phila, Pa.
Campbell & Clute, Cohoes, N. Y.
Champion Sewing Machine Co, N. W., cor. American and Diamond Sts, Phila, Pa.
Crane Mfg. Co, Lakeport, N. H.
Excelsior Knitting Machine Co, South Bethlehem, Pa.
Hepworth & Co, Lehigh Ave. and Mascher St, Phila, Pa.
Hodgson & Holt, Laconia, N. H.
Jenckes, E. Mfg. Co, Pawtucket, R. I.
Jones, Lewis, 60 1-2 and Media Sts, Philadelphia, Pa.
Kennedy, Thos. (Cutters, etc.), Cohoes, N. Y.
Keystone Automatic Napping Machine Co, Spring City, Pa.
Leighton Machine Co, Manchester, N. H.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Mueller, A, 760 Lexington Ave, Brooklyn, N. Y.
National Automatic Knitter Co, Cherry St, Philadelphia, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Paxton & O'Neill, 129 Bread St, Phila, Pa.
Payne, G. W. & Co, Pawtucket, R. I. (Winders.)
Pepper Mfg. Co, Lakeport, N. H.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stafford & Holt, Little Falls, N. Y.
Standard Machine Co., 508 Minor St., Philadelphia, Pa.
Taylor, James, 835 Arch St. Phila, Pa.
Union Raveller Co, Troy, N. Y.

Knitting Needles.

Breedon, Wm, & Son, Amsterdam, N. Y.
Corey, Wm, Co, Manchester, N. H.
Ives, Loyal T, New Brunswick, N. J.
Lydall, H, & Foulds, Manchester, Conn.
Mayo Knitting Machine & Needle Co, Franklin, N. H.
Page Needle Co, Chicopee Falls, Mass.
Star Needle Co, New Britain, Conn.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.
Treat, Orion, Manchester Green, Conn.
Wardwell Needle Co, Lakeport, N. H.

Laboratory Outfits.

Bullock & Crenshaw, 528 Arch St Phila, Pa.

Looms.

Crompton & Knowles Loom Works, Worcester, Mass.
Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1733 Barker St, Phila., Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

Loom Picker Manufacturers.

Crompton & Knowles Loom Works, Worcester, Mass.
Loom Picker Co, Biddeford, Me.
Novelty Loom Picker Works, 3-7 So. 48th St Philadelphia, Pa.

Lubricators.

Dixon, Jos, Crucible Co, Jersey City, N. J.

Lumber.

Stearns, A. T, Lumber Co, Neponset, Mass

Lumpers.

Gerry, George, & Son, Athol, Mass.

Machinery Dealers.

Schofield, Geo. L, 123 N. Front St, Phila,
Scott, James, 123 No. Front St, Phila, Pa.

Machinists' Tools.

Blaisdell, P, & Co, Worcester, Mass.
Whiton, The D. E. Co, New London, Conn.

Mails.

Walder, J, Paterson, N. J.

Measuring and Folding Machines.

Curtis & Marble Machine Co, Worcester, Ms
Elliott & Hall, 54½ Harmon St, Worcester, Mass.

Mill Builders and Engineers.

Berlin Iron Bridge Co, The, East Berlin, Ct.
Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Ashoff, Charles, 191 Berks St, Phila, Pa.
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Hill, Jas, Mfg. Co, Providence, R. I.
New Jersey Car Spring & Rubber Co, Jersey City, N. J.
Standard Mill Supply Co, 77 Exchange Pl, Providence, R. I.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg. Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Parks & Woolson Machine Co, Springfield, Vt.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Oilless Bearings.

N. American Metalline Co, 62 W. Ave. and 3rd St, Long Island City, N. Y.

Oil Filters.

Burt Mfg. Co, Akron, Ohio.

Paints.

American Fire Resisting Paint Co, 17 Broadway, New York.
Devoe & Reynolds, Fulton and Williams St, New York.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 73 Pine St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.

Pipe Covering (Magnesia).

Keasby, R. A, 54 Warren St, New York.
Keasby & Mattison Co, Ambler, Pa.

Nightingale, S. C, & Childs, Atlantic Ave, Boston, Mass.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Cresson, Geo. V, Co, Philadelphia, Pa.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kilburn, Lincoln & Co, Fall River, Mass.
Smeallie Bros, Amsterdam, N. Y.

Presses.

Crawford. J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Pownall, F. H, Iron Works, Jamesburg, N. J.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressure Regulators for Steam and Water.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass.

Printers and Embossers.

Novelty Textile Printing Co, 525 W. 24th St, New York.

Pumps.

Goulds Mfg. Co, Seneca Falls, N. Y.
Smeallie Bros, Amsterdam, N. Y.

Reed and Harness Manufacturers.

American Supply Co, Providence, R. I.
Gowdey, J. A, & Co, Providence, R. I.
Lathrop, H. V, Danielson, Conn.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.

Cheney Bros, S. Manchester, Ct.

Roller Skins.

Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.

Armitage Mfg. Co, Richmond, Va.
Warren Chemical & Mfg. Co, 45 Fulton St, New York.

Roofing, Paint and Paper.

Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Saddles, Stirrups and Levers.

Dixon Lubricating Saddle Co, Bristol, R. I.

Sample Cutters.

Gleason, A. H, Rockbottom, Mass.

Schools.

Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.

Birch Bros., Somerville, Mass.
Champion Sewing Machine Co, N. W., cor American and Diamond Sts, Phila, Pa
Curtis & Marble Machine Co, Worcester, Mass.
Dinsmore Mfg. Co, Salem, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.
Stoops, H. R, & Co, 66 No. 4th St, Phila, Pa.

Shearing Machinery.

See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.

Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.

See Wool Shoddies.

Shuttles.

See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.

Crompton & Knowles Loom Works, Worcester, Mass.

Singe Plates.

New Bedford Copper Co, New Bedford, Ms.

Sizing.

American Glutrose Co. Penn Mutual Bldg, Phila, Pa.

Skylights (Metal).

Van Noorden & Co, Boston, Mass.

Slashers.

Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.

Soaps.

American Soap & Washolene Co, Cohoes, N. Y.
Holbrook Mfg. Co., 466 Washington St., N. Y.
India Alkali Works, Boston.

Spindles.

Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Easton & Burnham, Pawtucket, R. I.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spinning Cylinders.

Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.

See Cotton Machinery.

Spinning Rings.

Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.

Spinners' Supplies.

Dixon Lubricating Saddle Co, Bristol, R. I.

Spinning Tubes.

Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.

Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.

Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.

Steam Damper Regulators.

D'Este & Seeley Co, 29 Haverill St, Boston Mass.

Steam Engines.

Brown, C. H, & Co, Fitchburg Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.
Newburgh Ice Machine & Engine Co, Newburgh, N. Y.
Toomey, Frank, 131 N 3d St, Phila, Pa.

Steam Separators.

D'Este & Seeley Co. (Curtis), 29 Haverill St., Boston.

Steam Specialties.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Steam Traps.

D'Este & Seeley Co. (Curtis) 29 Haverhill St, Boston, Mass. (return float and expansion).
Haines, W. S 132 So. 4th St, Phila, Pa.

Tanks, Tubs and Vats.

Brabender, Chas, Sr, Paterson, N. J.
Corcoran, A. J, 11 John St, N. Y.
Cypress Lumber Co, Apalachicola, Fla.
Cypress Tank Co, Bridgeport, Florida.
Hall, Amos H, No. 2nd above Cambria, Phila, Pa.
Oat, Jos, & Sons, 232 Quarry St, Phila, Pa.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.

Fleming & Chapin, 215 Church St, Phila, Pa.

Friedberger & Co, Germantown, Pa.
Kenyon, John J, Pawtucket, R. I.
Perseverance Mills, 2632-40 Mascher St Phila, Pa.
Schneebeli, Townsend & Co, Nazareth, Pa.
Weimar Bros, cor. Hope and Huntington Sts, Philadelphia.
Witter, H. M. & Co, Worcester, Mass.

Teasels.

Kellogg, Thos. C, Skaneateles, N. Y.
Kellogg, Wm, W, Skaneateles, N. Y.
McLaughlin Bros, Skaneateles Falls, N. Y.

Temperature Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.
Haines, W. S, 132 So. 4th St, Phila, Pa.

Tentering Machines.

See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.

N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.

Howard, Geo. C., 1783 Barker St., Phila., Pa

Traveler's Cheques.

American Express Company.

Turbines.

Burnham Bros, York, Pa.
Christiana Machine Co, Christiana, Pa.
James Leffel & Co, Springfield, Ohio

Valves.

D'Este & Seeley Co, 29 Haverhill St, Boston Mass.

Ventilating Apparatus.

Berry, A. Hun, 23 W. 1st St, Boston, Mass.
New England Heating & Ventilating Co Providence, R. I.
Pancoast Ventilator Co, Phila, Pa.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.
Van Noorden & Co, Harrison Ave, Boston, Mass.

Washers (Cloth).

Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116 Chambers St, New York.

Water Pressure Regulators.

D'Este & Seeley Co, 29 Haverhill St, Boston.

Water Wheels.

Burnham Bros, York, Pa.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co, Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.
Replogle Governor Works, Akron, Ohio.

Winders. (Hosiery.)

Payne, G. W. & Co, Pawtucket, R. I.
Universal Winding Co, 226 Devonshire St, Boston.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Webb, Chas. J. & Co, 156 N. Front St. Phila, Pa.

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crompton & Knowles Loom Works, Worcester, Mass.

Wool Extracts.

Daly, Jas. E., Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Muhlhauser, F, Co, Cleveland, Ohio.
Sullivan, R. T, 155 Federal St, Boston, Mass.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Atlas Mfg. Co., Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass.
Fairmount Machine Works, 23d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co, No. Adams, Mass.
Kitson Machine Co, Lowell, Mass.
McKerrow & Bennett, 31 State St, Boston, Mass.
Payne, G. W. & Co, Pawtucket, R. I.
Sargent's, C. G., Sons, Graniteville, Mass.
Stoddard, Haserick, Richards & Co, Boston, Mass.
Thun & Janssen, Reading, Pa.
White, John F, 38 River St, Providence, R. I.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Wool, Hair and Noils.

Fowles & Co, 102 Church St, Phila.
Lyon, John H, & Co, 12 Reade St, N. Y.
Muhlhauser, F, Co, Cleveland, Ohio.
Webb, Chas. J, & Co, 156 N. Front St, Phila Pa.

Wool Shoddies.

Bowers', James, Sons, Ltd, Chester, Pa.
Daly, James E, Paterson, N. J.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Muhlhauser, F, Co, Cleveland, Ohio.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters and Scourers.

Duross, Theodore A, Kensington Ave. and Huntingdon St, Phila.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.

Wool Washing, Preparing and Drying Machinery.

Kitson Machine Co, Lowell, Mass.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Kenyon, John J, Pawtucket, R. I.
Moore, C. & Co. 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
White, James F, & Co, N. Y. and Phila, Pa.
Whittier Cotton Mills, Lowell, Mass.

Carpet Yarns.

Fleming & Chapin, 215 Church St, Phila, Pa.

Cotton Yarns.

Catlin & Co, New York and Boston.
Dana Warp Mill, Westbrook, Me.
Eichman & Sternberg, 488 Broadway, N. Y.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Tucker & Cook Mfg. Co, Conway, Mass.
Wilmington Mills Mfg. Co, Wilmington Del.

Cotton Warps and Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Clark, Wm, Co, Westerly, R. I.

Cohannet Mills, Taunton, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown Pa.
Globe Yarn Mills, Fall River, Mass.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Monument Mills, Housatonic, Mass.
North Athens Cotton Mills, Athens, Tenn.
Orswell Mills, Fitchburg, Mass.
Montgomery, J. R, Co, Windsor Locks, Ct.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co., 86-88 Franklin St.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Blodgett & Orswell, Pawtucket, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Kenyon, John J, Pawtucket, R. I.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Hadley Co, 95 Milk St, Boston, Mass.
Kerr Thread Co, Fall River, Mass, and 29 Mercer St, N. Y.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C, & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

Abegg & Rusch, 92 Grand St, New York.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Croll, Albert Ivins, Boston, Mass.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Germantown Spinning Co, Germantown, Pa.
Globe Yarn Mills, Fall River, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Holland & Webb, 487 Broadway, N. Y.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Kerr Thread Co, Fall River, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Porter Bros, 78 Worth St, New York.
Rockwell, E. M, Leominster, Mass.
Sanford Spinning Co, Fall River, Mass.
Sawyer, Manning & Co, 86-88 Franklin St, N. Y.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Trenton Worsted Mills, Trenton, N. J.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Lowell, Mass.
Whittier Cotton Mills, Lowell, Mass.

Jute Yarns.

Eichman & Sternberg, 488 Broadway, N. Y
Wilmington Mills Mfg. Co, Wilmington, Del.

Mohair Yarns.

Abegg & Rusch, 92 Grand St, New York.
Eichman & Sternberg, 488 Broadway, N. Y
Holland & Webb, New York.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Cranston Worsted Mills, Bristol, R. I.
Eichman & Sternberg, 488 Broadway, N. Y.
Holland & Webb, New York.
Malcolm Mills Co, 216 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Ramie.

Holland & Webb, New York.

Silk Noils and Yarns.

Skerry, A. T, 47 Leonard St, New York.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eichman & Sternberg, 488 Broadway, N. Y.
Fleming & Chapin, 215 Church St, Phila, Pa.
Hawes, O. S. & Bro, Fall River, Mass.
Holland & Webb, 487 Broadway, N. Y.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Spun Silk Yarns.

Champlain Silk Mills, Whitehall, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
River Spinning Co, Woonsocket, R. I.
Rockwell, Edward M, Leominster, Mass.
Sawyer, Manning & Co, 86 and 88 Franklin St, N. Y.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Abegg & Rusch, 92 Grand St, N. Y.
Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson St, Camden, N. J.
Eichman & Sternberg, 488 Broadway, N. Y.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Porter Bros, 78 Worth St, New York.
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Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
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SITUATIONS WANTED.

W. H. COTTON.

A practical mill man is in charge of the Information Department and Overseer's Bureau.

The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

WOOLEN SUPERINTENDENTS.

1258 **Woolen** Superintendent, Carder, Spinner or Weaver. Has experience in dyeing. Is a reliable man. 40 years old. Refers to responsible parties as to character and ability.

1255 **Felts.** The advertiser has a thorough, practical knowledge of all the details connected with the manufacture of paper makers' felts and jackets; especially adapted for fast running machines; good reason why he is now in the market; recommended by past employers.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

1239 **A man who understands the** manufacturing of woolens in all the details, is open for an offer. Is an experienced manager, and is at present in charge of a mill that is being run at a profit.

1227 **A Superintendent** with a thorough practical training in all the departments of a woolen mill making worsted cassimeres, dress goods, cloakings, overcoatings, robes, blankets, shawls, etc. Has a thorough knowledge of designing and has held position in first class mill, to which he can refer.

1231 **Manufacturer.** One who has had a thorough experience in the management of a mill of his own, and who can show proof as to his ability, is now in the market for a position as superintendent or assistant superintendent with any good company. Age 40; married.

1219 **Superintendent.** A young man who has had a practical experience in every department of a woolen mill, including designing, wishes to secure a position as superintendent, designer or both. Is highly recommended by his present employers for whom he holds a position as overseer. His strong points are on cassimeres, cheviots and Unions.

1208 **Designer or Superintendent.** Graduate of textile school. Experienced in most kinds of woolens. During the eight years very successful on fancy worsteds and cassimeres, also overcoatings 35 years of age and married. The best of references as to ability and character.

1225 **Woolen** mill man, 40 years of age, wants position as superintendent, carder, spinner, or spinner and carder. A practical man in each department.

1222 **Superintendent, Designer and** Weaver. Wants a position in woolen or worsted mill. Understands the work thoroughly, on a great variety of goods.

1203 **Superintendent, Woolen,** or superintendent and designer. Age 39; married. Has held a position as superintendent 9 years; 2 years in one mill and 7 in another. Has good references. A good man on meltons, coverts, cassimeres, worsted and kerseys; also serges.

1174 **Woolen Superintendent** wants a position as superintendent, designer or weaver. Age 47; married. Crompton or Knowles looms, cheviots, suitings, tricots and face goods Don't want a position in Canada. Good references.

COTTON SUPERINTENDENTS.

1236 **Superintendent** of cotton mill desires to change positions. Is thoroughly competent, steady and reliable. Good mechanic and a good manager. Has push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quality, quantity and lowest cost. Best system of economy maintained. First class references can be given.

1114 **Superintendent and Overseer,** wants position on cotton goods, has had a first-class experience, and can furnish first-class references. Will go anywhere; age 39 and married; salary reasonable; is a first class man on seamless bags.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

1133 Is a good man on cotton goods; age 43; married; American, wants position as superintendent. Refers to first-class companies; is well posted on various kinds of machinery.

1184 **Cotton Mill Superintendent,** wants position. Age 50; married. Sheetings, shirtings, drills, etc.; also all kinds of yarns and yarn dyeing. Has good references. Superintendent eighteen years at one mill.

WOOLEN CARDERS.

1249 **Carder and Spinner,** woolen, wants position. Familiar with a great variety of goods. 37 and married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1230 **Superintendent or Carder and** spinner wants position in woolen mill. Age 30; married. Can take position at once. Familiar with jeans, cassimeres, flannels, knit goods and shoddies.

1233 **Felt** Overseer of Carding. A good man on felt or woolen goods. Aged 35; married. Can refer to past employers.

1082 **Woolen carder experienced on** all classes of underwear. Has worked for eight years in one mill, 29 years of age and married. Good references.

1241 **Woolen Carder.** Age 40; married. Overseer 14 years in one place. Long experience on all-wool, wool and cotton mixed, shoddy, etc. Temperate, and can furnish good references. Prefers Philadelphia.

1197 **Woolen Carder** wants position. Overseer over 16 years in some of the best woolen mills. Accustomed to all kinds of work. Age 50; married. Well recommended.

1190 **Woolen** Carder or Spinner. Age 47; married. One reeler and one piecer in family. Has been overseer and spinner for the last fifteen years for one firm, which is now out of business. Refers to past employers. Can take position at once. Familiar with wool shoddy and cotton; Furbush, Lee and other makes of machinery.

1153 **Comber.** Understands repairing and running combers, speeders and cards. Overseer seven years in one of England's fine mills, on counts ranging from 120s to 150s. Will accept a position as overseer or 2d hand. Refers to responsible parties as to ability and character.

1213 **Woolen Carder** wants position. Age 45 and married. Is familiar with a great variety of work.

COTTON CARDERS.

1138 Second hand of cotton carding wants position. Has had a good experience in that position. References.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

922 **Cotton** Carder. Age 47 years. White or colored work. A thorough carder and a reliable man.

910 **Overseer** of cotton carding. Good man on white or colored yarns, for plain or fancy work. Age 42; married.

502 **A First** class cotton carder and spinner is open for an engagement. References are of the best.

1138 **Second Hand** of cotton carding wants position. Has had a good experience in that position.

1260 **Carder.** Wants position as overseer on fine goods, or coarse; age 27.

910 **Is a good carder** on plain, colored and fancy white stock. Age 41. $2.50 and up.

WOOLEN SPINNERS.

1223 **Wants position as Overseer of** Spinning or Twisting, or both. Familiar with fine or coarse numbers. Refers to past and present employers.

1195 **Spinner, Woolen.** American; age 31; married. Experienced on yarns from 1 to 7 1-2 run. Refers to past and present employers. Wants position as overseer. Will not go to Southern States, Canada or Connecticut. Is an experienced overseer.

1152 **Woolen Spinner** wants position as overseer or 2d hand, in Southern or Western States, or Pennsylvania. Age 20; single. Understands Johnson & Bassett operators and mules. Has worked on a variety of goods. Good recommendations as to character and ability.

1112 **Overseer of Woolen Spinning** wants position. Has first-class references. Age 37. Wages reasonable. Will accept second hand's position.

1111 **Overseer of Spinning** wants position. Age 48 and married. Has good recommendations from last employers. Has worked on cassimeres, wool shoddy, fancy elderwown and flannels. Will go anywhere.

COTTON SPINNERS.

1171 **Overseer of Cotton Ring Spinning.** Age 25; good references. Has made yarns from number 8s to 100s. A good manager of help.

1243 **Mule** spinner; cotton. Age 36; married. Prefers New York or Massachusetts; references.

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

1204 **Situation wanted** as boss spinner, or second hand and mule fixer on Pla t mules. Many years experience on yarns for dress goods in England, and also yarns for fine woolen cloth. 35 years old and married; good references.

1196 **Mule or Ring** cotton spinner wants position as overseer. Age 36; married; 12 years in one mill; 6 years as mule spinner, 2 years as second hand and 4 years as overseer. Has had a very thorough experience on tickings, shirtings and denims. Used to both English and American make of machines. References are good; can accept position at once.

1189 **Spinner, Cotton, Mule or Ring.** Age 38; married. Ginghams, dress goods, flannels and hosiery yarns. English or American make of machinery. References if desired. Don't want a position in Maine, Canada or any Western state.

1198 **Cotton Spinner,** spooling, warping, slashing, web drawing, skein winding and quilting on linen. Well recommended. Age 42; married. Has worked in some of the best mills. Will go anywhere. Would accept a good second hand's position.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

WOOLEN WEAVERS.

1008 **Wants boss job in flannel mill.** Northern New England preferred, also a good man for dresser or fixer, has worked on flannels, serges, cheviots, fancy dress goods. Is 34, married.

1216 **Weaving and Dressing.** Man wants position as overseer of weaving or dressing, or both, in some good woolen mill. Has had 16 years' experience. Can pick patterns and figure yarns. Has references.

1253 **Weaver, Designer or Superintendent** Open for a position. Refers to past and present employers. Aged 47; married. Worsted cloakings, cassimeres and dress goods.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1115 **Overseer of Weaving** wants position in woolen mill; age 50 and married; mill stopped, cause of being out of a position; is a reliable man, first-class references; has worked on dress goods, carriage cloths, blankets, etc.

COTTON WEAVERS.

1242 **Overseer Cotton Weaving.** Familiar with plain cloths, sateens, fancy checks and stripes, box looms and dobbies. References. Age 43; married. One weaver, one twister in family.

1235 **Cotton** man wants position as overseer of cotton weaving. Prints, twills, satins, denims, cheviots, lenoes, etc. Crompton, Knowles, Lowell, Whiting and English looms.

1110 **Overseer of Cotton Weaving,** fancy or plain. Age 42; German. Wants position as overseer, or will take second hand's position. Has had charge where first-class goods are made. Good references.

1261 **Weaver.** Cotton, woolen, ramie and silk goods. Good experience in first-class mills.

176 **Wanted** a situation as cotton weaver or as superintendent; am a strictly temperate man; married; 40 years old; am a practical man and a pusher. Will go anywhere, and at any price to suit the times. Will guarantee satisfaction in every respect. Now employed. Correspondence invited. Can furnish good references if required.

1247 **Elastic** weaver wants position as overseer. Used to cotton web, elastic suspenders, silk neckwear, dress goods and handkerchiefs. 28.

176 **Wanted.** A position as overseer of weaving, second hand or loom fixer, either in a cotton, woolen or jute bagging mill, by a faithful, sober, steady man, fully capable in either of the above positions. References furnished as to character and experience.

1127 **Overseer of Weaving.** French. Age 36; married. Understands sheetings, drills and prints. Will go anywhere. Out of work; mill stopped. Refers to past employers.

FINISHERS.

1041 **Woolen Finisher.** Has had experience on fancy and piece dyed goods, cassmeretes, cheviots, worsteds, kerseys and dress goods. Wants position as overseer or second hand in New England States. Age 26 years. Will work for $2.50 per day.

1207 **Woolen or worsted** finisher wants position as 2nd hand in some first-class mill. Has had a good experience as 2nd hand, and refers to past and present employers; age 28. Especially strong on Scotch tweeds, dress goods and fancy cassimeres. Familiar with English and American machinery.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

228 **Is an A1 Woolen Finisher.** Age 36; married. Has been employed in two of the very best mills in New England, and refers to them as to character and ability.

1251 **Finisher,** woolen. Aged 29; married. Experienced on all classes of goods. Has had charge of finishing in a first class mill the past five years. References O K.

DYERS.

1234 **Dyer,** woolen. Aged 27; married. Strictly temperate. Out of a position through causes over which he had no control. Is recommended by some of the solid men. Wool slubbing, skein and piece goods, also indigo vats.

1217 **Woolen Dyer,** wants position as boss dyer on beavers, kerseys, dress goods, cloakings, piece dyes, worsted yarns, both with machine and hand dyeing. Also wool in fancy colors.

1218 **Dyer of Fast Colors.** On wool and worsted in the stock, slub, yarn and piece, and who is a graduate chemist of the Massachusetts Institute of Technology. Wants a situation.

1201 **Wants** position in laboratory manufacturing, house or mills, or would accept a position as second hand of dyeing. Age 28; single. Has been employed by two of the best houses in the country. Can take position at once. Western and Southern States barred out.

1188 **Dyer** on cotton yarn or thread. Age 28; married. Will not go South or to Canada. References if required. Six years' experience as second hand in a first class thread mill.

1194 **Dyer, Woolen;** age 32; married. Has held position as assistant dyer and overseer of dyeing. Refers to present employer; good reason for changing. Could take position on one week's notice; worsted yarns, wool in stock and piece dyes.

1199 **Dyer** wants position on fancy cotton skein yarns, long and short chains. Has thorough knowledge of alizarine and indigo blue dyeing. Also fancy piece dyeing. Has 20 years' experience. Can give first class references.

1246 **Dyer.** Raw stock, both cotton and wool; yarns, mixed stock, piece dyes, all wool and shoddy mixed. Aged 44 years; married.

1254 **Dyer;** 28 years old; experienced in England and American dyehouses; familiar with hosiery, cotton, wool and mixed goods; good references.

KNITTERS.

1224 **Knit.** Superintendent. Understands all makes of machines; silk, wool, merino, worsted, lisle and cotton goods. References all right. Age 35 years.

1066 **Knitter.** Age 25; single; underwear, cotton and worsted; references.

677 **Knitter** wants position. Is a man fully capable of handling a knitting plant, hosiery or underwear. Age 32; married. Best of references as to character and ability. Can take position at once.

887 **Superintendent.** Is a practical mill man with 20 year's experience in carding, spooling and knitting. Age 35. Now employed in one of the best mills in New England.

1257 Superintendent of knitting mill wants position; is a finisher and understands every part of the business, including shipping all kinds of goods, fabrics, cotton, worsteds, silks, wool on all kinds of shapes, and flat goods; most all kinds of knitting machinery and finishing machinery; age 32; married; refers to past record.

1180 Wants position as 2nd hand of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

DESIGNERS.

1240 **Designer of Cotton and Mixed** Dress Goods. Jacquard and dobby (age 26) wants situation. At present head designer for a firm in Lancashire, Eng. Good sketch maker and originator, and thoroughly understands working of design to loom, as all the latest card cutting and repeating machinery. Not afraid of work. Willing to work for a firm just commencing in fancies at a progressive salary. Has obtained highest certificates in honors for weaving and designing, and clothworkers medal for same.

1232 **Good Woolen Designer** wants position as superintendent or designer. Good references. Aged 39 years; married.

1211 **Designer.** Open for an engagement. A first class man on worsteds and woolens, and cotton and worsted mixes, cassimeres and cheviots, cheap and fine goods.

1245 **Designer,** or superintendent and designer. Thoroughly experienced as superintendent and designer. References all right. Familiar with a great variety of goods.

1263 **Assistant** Designer or Assistant Superintendent. Has received a practical mill experience, and is a graduate of the Philadelphia Textile School. Unions, cassimeres, suiting, cloakings. Age 24 years.

1259 **Color Designer** or Woolen Superintendent. Age 39. Good, steady reliable man. Refers to past employers.

1252 **Designer, Weaver or Dresser.** Aged 40 years; married. Familiar with nearly all kinds of men's wear, piece dyes, etc. Refers to past and present employers.

MISCELLANEOUS.

1229 **Dresser.** Overseer of woolen dressing. Age 30. Men's wear and dress goods. Good references.

1226 **Overseer of Cotton Weaving.** Age 30; married. Accustomed to sheetings, shirtings, twills, drills, fancies and quilts. Can take place at once. Refers to present and past employers.

1209 **Book-keeper** is open for an engagement. Will accept a position in any State. Could take a position at once. Has first-class references.

1156 **2nd Hand of Dyeing** or overseer of washing and bleaching wants position. Familiar with knit goods, wool. Age 33. Don't want a position in Canada or the Western or Southern states. Can take position at once; good references.

1162 **Good Man for Beaming Department.** On heavy sized, plain calicoes and colored cotton goods, twills and sheetings. Will go anywhere. Age 33; married. Good references.

1202 **Silk Superintendent** is open for an engagement with a first-class company. Has a thorough knowledge of all the details connected with the manufacturing of silk ribbons and hat bands, from throwing to the finished product. Has held the position of superintendent of a first-class mill for several years. Under 30 years of age, and married. Has the best of references. For any further information address this paper.

1228 **Shearer.** Wants position as overseer of shearing. Good man on cassimeres, worsteds, unions and cheviots. Age 25; married. References.

1192 **Worsted Steam Dresser** wants position as overseer. Has worked in some of the best mills in England and America. Has high references; age 36; married. Has a thorough knowledge of both plain and fancy work.

1087 **Overseer of Beaming, Designing or Weaving.** 35 years of age. Married. Has worked on dress goods, silk striped shirtings, pantaloon goods, ginghams, etc. Highly recommended. Will go anywhere in the United States.

1151 **Asst. Superintendent or Designer** wants position. Age 33; married. Worked on cloakings, fancy worsteds, cheviots, dress goods and cassimeres. Can refer to past employers.

1137 **A Salesman for an Underwear** Mill. Would prefer the account of some large underwear mill exclusively. Salary or commission. Is an experienced salesman and with 9 years practice in the manufacture of knit underwear.

1205 **Designer, Woolen,** wants position. Age 30 and married. Refers to some of the best men and mills. Prefers a position in Mass., R. I., Conn., Penn. or N. Y. Experienced on plain and fancy woolens and worsteds, cheviots, cassimeres and fancy tweeds.

1141 **Overseer of Wool Sorting** wants position. Understands sorting and grading in all its branches; 20 years experience as boss sorter. Can give the best of references from past and present employers. Is a good judge of the shrinkage of wool, and understands the selection of wool in market for mill. Has six workers in family.

1157 Wants position. Has a general knowledge of all departments in a cotton mill, and can fill most any position. Has highest of references; age 26, married.

This Sample Cutter

was desiged by a manufacturer for his own use, and finding it better than anything he could buy for the purpose, he offers it to other manufacturers at a reasonable price. Send for circular to

A. H. GLEASON,
ROCK BOTTOM - MASS.

Established 1844.

BENJ. BUCKLEY'S SON,

(WM. J. BUCKLEY)

GUN MILL, PATTERSON, N. J.

Manufacturer of all kinds of

SPINDLES, FLYERS, RINGS, TUBES, CAPS, &C.

FOR

Cotton, Silk, Flax, Woolen and Worsted

MACHINERY.

Roving Spindles and Flyers a Specialty.
Light Forgings. Repairing of all kinds.

Knitting Machinery

FOR SALE.

We wish to sell the following machinery, having made arrangements to have our goods made in a large knitting mill in New York State. We wish to dispose of all our machinery, which has been in use only two months. This machinery was made with special care, as it was intended by the makers to be used as an advertisement for them in this city.

4 McMichael & Wildman Knitters, 8, 10, 11, 12 inch cylinders, 12 needles to inch.

1 Wheeler & Wilson Button-hole machine,

2 Union Button Sewing Machines.

2 Merrow Overseamers, No. 38.

7 Union Special Seamers.

Sewing Machine Tables for 4 sewing machines.

Enquire at Elevator,
120 Kingston St., Boston.
OR WRITE
J. H. FITZPATRICK,
157 Broadway, South Boston.

Cloth Boards,

BOX BOARDS,
BOX SHOOKS,
MILL FLOORING AND CEILING,
YELLOW PINE TIMBER.

THOMPSON, SNOW & CO.,

GREENFIELD, MASS.

FOR SALE, SECOND-HAND MACHINERY.

Double Corliss Engine, cylinder 23x60 in. Single Corliss Engine, cylinder 20x48 in. Singles Corliss Engine, cylinder 16x36 in. Single Corliss Engine, cylinder 12x24 in. 30-40 50-80 and 100 H. P. Automatic Engines.

Large stock of Plain Slide Valve Engines, Boilers, Steam Pumps, Feed Water Heaters, Lathes, Planers, Shapers, Drill Presses, Milling Machines, Electric Motors and Dynamos, and Wood-working Machines. Let me know your wants as my stock is constantly changing. Yours respectfully, FRANK TOOMEY, 131 No. 3rd St., Philadelphia.

WANTED.

A man practical in the manufacture of Hosiery to take an interest and devote time to a business well established. Machinery new and up to date. Address "H" care Textile World.

THE AIR LIFT.

We have just published an interesting

CATALOGUE, (No. 72,)

describing and illustrating the "Pohle Air Lift" and other methods of

Pumping Water by Compressed Air.

Everyone interested in securing a plentiful supply of water economically, should have a copy of this catalogue. It will be sent free to your address upon application.

The Ingersoll-Sergeant Drill Co.,
Havemeyer Building, N. Y.

FOR SALE.

New and Second-hand Noble Combs, Gill Boxes, Drawing, Spinning and Twisting Machines. Also 72 in., 85 in., 115 in., Knowles Looms, fitted up for Jacquard work, Cop Winders, Chenille Reels, Chenille Cutters and Tassell Making Machines. All kind of Change Wheels for worsted mills, Belting and Mill Supplies kept in stock. Apply to

EDWARD JEFFERSON & BRO,

28 Strawberry Street, Philadelphia, Pa.

SOLE AGENTS FOR

J. B. Farrar & Sons, Halifax, England,

Mfrs. Spinning, Drawing, and Twisting Machinery.

Oil Filters...

We are the largest manufacturers. Our "Cross" Filter has been on the market 7 successful years. Used in 12 countries. Specially adapted to Cotton and Woolen Mills. Capacities 3 to 120 gals. per day. Sent on approval. Reduces oil bills 50%. Interesting reading matter upon request.

The BURT MANUFACTURING CO.
Akron, Ohio, U. S. A.

FOR RENT OR SALE,

Near Downingtown, Penn.,

A Two-Set Woolen Mill, with 60-inch Cards, in splendid order; also twenty Houses to go with mill. Mill rent cheap, with privilege of buying the plant. The mill has only been stopped since May 22, 1897.

For further information address,

JARVIS ELLIS, Manager,
Box 83, Downingtown, Pa.

FACTORY SITES

FOR SALE
in the fast growing village of
DOLGEVILLE, - N. Y.

Water unexcelled for Wool Washing.
Power furnished at very low price.
Good Locations along Railroad.
Best Shipping Facilities.

FOR PARTICULARS ADDRESS
ALFRED DOLGE, Dolgeville, N. Y

Bonus. The Fort Covington Board of Trade has a large bonus to offer to any company or person who will locate in the village of Fort Covington and operate some kind of a factory. The said village is well located, with good shipping facilities by rail or boat. Correspondence solicited. Address W. G. Cushman, Sec., Treas., Fort Covington, Franklin Co., New York.

RIGGS & COMPANY,

(ESTABLISHED IN 1872.)

Business and Financial Brokers,

573-575-577 Bourse, Philadelphia, Pa.

Sell all kinds of legitimate business, negotiate partnerships, procure special capital, sell stocks and bonds of first-class manufacturing and mineral corporations, and act as trustees and transfer agents. Business transacted in all parts of the Union and Canada.

Those writing us for our terms will kindly state amount involved, as they are governed thereby according to a uniform list of rates.

Cotton Mill for Sale.

A fine 6000 spindle Cotton Mill, equipped with all machinery for making yarns 8's to 20's, 2, 3 and 4 ply, tube yarns, ball twines, etc.

The mill is now in successful operation under a 2 year's lease, but said lease, subject to sale at 90 days' notice.

The property embraces a very valuable water power, and is now developed by two modern double Turbine wheels, furnishing 250 horse power, with capacity of steam of **double** the present development.

These mills are located in a section of country that possesses many advantages in manufacturing. Will be sold on easy terms. For full information call on or address, THE BANK OF MARYVILLE, Maryville, Tenn.

Hosiery Mill For Sale or To Let!

A new plant, capacity 100 dozen per day.

Water Power To Let, 400 H. P., with excellent buildings.

W. K. DANA, Westbrook, Maine.

$200.00 (Two hundred dollars) will buy a complete, one set, woolen machinery, (second hand), with carding machines and picker. For further information address,

H. B. BORNEMAN,
Portland. North Dakota.

Mill Supply Business For Sale!

An old established Cotton and Woolen Mill Supply business, with very desirable connections and good line of customers, is offered for sale for personal reasons. Located in Massachueetts. Business in good shape; can do $50,000 per year. Address in confidence,

"COLUMBIA," care Textile World.

TEXTILE WORLD'S

DIRECTORY OF THE

MILL TRADE

IN THE UNITED STATES.

A BOOK OF 360 PAGES OF CONVENIENT SIZE.

COMPRISING COTTON MILLS, WOOLEN MILLS, KNITTING MILLS, SILK MILLS, FLAX, JUTE AND LINEN MILLS, PRINT WORKS, BLEACHERIES, DYEING AND FINISHING ESTABLISHMENTS, ARRANGED ALPHABETICALLY BY NAME OF MILLS AND ALSO GROUPED ACCORDING TO LOCATION. ILLUSTRATED BY SPECIALLY PREPARED TEXTILE MAPS, SHOWING THE LOCATION OF MILL TOWNS AND CITIES.

Detailed information is given about each establishment, viz., the name of the company or firm, names of officers, agent, superintendent, what the mill makes, number sets of cards and combs (if woolen), number of spindles, number of looms, whether steam or water power, whether a dye house or not, who the selling agents are, or if the mill sells direct. In many instances it gives the name of the buyer of raw materials and supplies. To the travelling man, this directory is invaluable, as the maps give the location of the towns where there are mills, so that trips may be planned. The railroad connections are given, and distances may be estimated accurately from the maps.

IT ALSO HAS LISTS OF LARGE BUYERS OF TEXTILE FABRICS FROM FIRST HANDS INCLUDING MANUFACTURERS' SELLING AGENTS AND DRY GOODS COMMISSION MERCHANTS IN PRINCIPAL CITIES; THE MANUFACTURING CLOTHIERS, SUIT AND CLOAK MAKERS, JOBBERS, LARGE RETAILERS BUYING FROM FIRST HANDS. ALSO LISTS OF DEALERS IN RAW MATERIALS IN PRINCIPAL CITIES. BUYERS' INDEX OF TEXTILE MACHINERY AND SUPPLIES.

This directory is supplemented from month to month by the reports in the TEXTILE WORLD, and six months after its publication, a special statistical issue of the TEXTILE WORLD will contain supplementary data accrued in that time.

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NOW READY FOR DELIVERY.

Capital, $1,200,000.

100,000 SPINDLES.
Weekly Product 120,000 lbs.
14's to 160's.

HIGH GRADE

Cotton Yarns,

SPECIALLY ADAPTED FOR

Silk, Plush, Upholstery & Hosiery

MANUFACTURERS.

American Peelers. Sea Island. Egyptian Cottons.

Superior Qualities Combed and Carded—Furnished in singles, 2, 3, 4 and 6-ply Main warps, skeins, beams, spools, tubes, cones and Lisle Thread yarns.

Cops for Weaving and Twisting. Cops for Hosiery.

GLOBE YARN MILLS,

Fall River, Mass.

E. B. JENNINGS, - - Treasurer.

Arnold B. Sanford, *Pres.* Arthur H. Mason, *Treas*
Capital Stock, $500,000.

Sanford Spinning Co

FALL RIVER, MASS.

30,000 Spindles. Weekly product, 50,000 pounds 14s to 40s.

NOVELTY COTTON YARNS,

FROM AMERICAN PEELERS AND EGYPTIAN COTTONS.

OUR SPECIALTY: Superior qualities of Hosiery Yarns, Natural Shades of Cottons, and in Colors, Jaegers, Mixes, and Bleached, Hosiery Cops on Long Tubes, Skeins, Tubes, Cones and Lisle Thread Yarns. Furnished in Carded and Combed Qualities in Singles, 2, 3 and 4-plies.

YARN DEPARTMENT.

Eastern Yarn Market.

Worsted Yarn. Spinners are working very cautiously and are accepting orders for limited amounts. They quote prices in many instances for given amounts to keep machinery running. A Philadelphia spinner who has been running his mill during the dull period, is unloading some of his yarn at very near old prices; others, however, will quote no prices at all, but ask for offers without committing themselves. Some are offering to take orders for next season's delivery at about 3 to 4 cents per pound advance. The spinners are "at sea." The different opinions are expressed in the different offers made in the trade. When the tariff bill passed the House, the spinners at once advanced prices about 10 cents per pound. The weavers could not and would not pay the advance, and thus the price has declined about 5 cents per pound from the highest rate asked. The light weight season will not see a great advance on cloth. The heavy weight season will catch a portion of the advance. The manufacturers are trying to stop manufacturing heavy weights for this present season, as there is a desire to stop using wool already purchased. Their methods are various. One man told his commission house and customers that he did not care to make more heavy weights, but would make light weights for next season, without advancing prices. His idea is this: he is using 3 pounds of wool and yarn in his heavy weights. If he starts in to make light weights, he will use only 1 1-2 pounds of material, and save half his wool for his next heavy weight season and get a good advance on it. One very large weaver-spinner, who also purchases yarn, told us that he had all the orders for fancy worsteds that he wanted for this season, and after July 1st, he would take no orders for piece dyed worsted, as he said he was going for the advance after that date. We also hear of a large weaver who has made two advances of 12 1-2 cents per yard on his goods, and has been able to get the advance. Some weavers are refusing to take any further orders at any price, and are going to stop running for two or three months, and have notified their commission houses that they want no more orders even though they are offered at 10 per cent. advance. They say that buyers will place orders at an advance of 10 per cent., if the tariff bill is passed (as it will be, of course). Prices we will not quote, because there is no stability to them. As soon as the tariff is passed, we look for a marked advance on the finer qualities. For cheviot yarns, we do not expect a great advance. The knitters of worsted yarn are not doing much business, but as all the trade is backward, we believe that the knitters will have their turn later.

Woolen Yarn. Spinners are getting some orders from weavers, but are getting very few orders from the knitters. Knitters are unable to get orders at an advance. The larger jobbers will buy only at the old prices. The smaller ones will not place orders at this time at any price. Spinners with a stock of wool on hand can get orders, but when forced to buy on the market, cannot get within 4 or 5 cents of what buyers are willing to pay. It looks very much as though there were hard times ahead, until prices get adjusted. We look for a sharp advance when the tariff bill is passed, and an equally sharp decline, and then a permanant advance. We have reports all over the country, which show little doing, with large stocks on hand, and the mills have at

(Continued on page 131.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

GERMANTOWN SPINNING COMPANY INCORPORATED GERMANTOWN JAN. 9TH 1890

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 26s.

Germantown, Philadelphia.

GEORGE SHIMER & SON,

Spinners of Worsted Yarn for the Weaving and Knitting Trade.

All kinds of Fancy Yarns for the Knitting Trade.

5th and Erie Sts., Camden, N. J.

Established 1865.

H. M. WITTER & COMPANY,

Manufacturers of

COTTON WEBBING, TAPES AND BINDINGS,

Worcester, Mass.

WEAVING and HOSIERY YARNS.

We Buy for Cash

WARPS, COPS, TWIST and SOFT SKEINS, Single, Double, 3-ply, 4-ply, etc.

COLORED YARNS for HOSIERY

on Cones, a Specialty.

Correspondence Solicited.

EDWARD S. HYDE, 223 and 225 Chestnut Street, PHILADELPHIA PA.

Glazed, Bleached and Dyed

YARNS

Cone Winding.

W. WARREN THREAD WORKS.

WRITE US WHAT YOU USE, WE WILL DO THE REST.

WESTFIELD, - MASS.

(Continued from page 129.)

least six months' stock on hand, how can an advance be expected, until the stocks are lowered. On the other hand, much wool has been purchased on speculation and is withdrawn from the market for at least one year. Slubbing waste, ring waste, thread waste, noils, etc., are not shoddy, and that is what some Westerners should be taught before they talk of these most necessary articles which manufacturers need.

Cotton Yarn. Spinners are getting some inquiries for yarn, and also offers. The prices offered are very low and such that spinners will make no further concessions. The New Bedford Mills' failures are acting as a warning and object lesson to spinners, and show the folly of making and selling yarn at prices which show a positive loss to the spinner. Knitters naturally dispute this statement as they are the beneficiaries, but a little figuring will prove that the spinner who sells 11s or 12s white cop yarn, such as is now being sold, which is positively without a mixture of waste, for 12 1-2 cents per pound, is not getting out whole. Middling cotton costs, say, 8 cents per pound, then add freight, commission for selling, guarantee and interest, and it will figure at least 1 1-2 cents per pound or 9 1-2 cents, which leaves 3 cents per pound for spinning and shrinkage in the manufacture, and wear and tear on machinery. It is not possible to figure out a profit, and knitters should realize that the spinner cannot continue to work on this basis. In the above yarns there is nothing but straight cotton. Knitters who had orders placed with the defunct mills in New Bedford, were doing considerable hustleing the early part of the month, but it seems now that these spinners are going to fill contracts previously taken. There have been many stories going round the trade about sales of yarn, which, however hard they may seem, are undoubtly based on facts. Before

(Continued on page 133.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

SAWYER, MANNING & CO.,
YARNS,
86 & 88 Franklin St., NEW YORK.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
51 & 53 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY YARNS,
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON WARPS
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. WARPS

E. Jenckes Manufacturing Co.
COLORED COTTON YARNS,
Cops and Cones.
PAWTUCKET, - R. I.

CAPACITY, 50,000 Spindles. **ORSWELL MILLS** FITCHBURG MASS.

COMBED OR CARDED
COTTON YARNS
In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

YARNS
SOLIS - - BOSTON.
179 Devonshire Street.
ANDREW J. SOLIS, Jr. & CO.

Cotton Yarns AND WARPS Of Every Description.
James F. White & Co.
COMMISSION MERCHANTS,
54 an 56 Worth St., NEW YORK.
228 Chestnut St., PHILADELPHIA.
BURLAPS all WIDTHS and WEIGHTS.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
HOUSATONIC, MASS. 4s to 60s.

Hosiery AND Weaving Yarn ALBERT IVINS GROLL, BOSTON

THE WILMINGTON MILLS MFG. CO.
MANUFACTURERS OF **JUTE GOODS,**
CARPET FILLING AND RUG YARNS,
Wrapping, Baling, Tobacco, Hop and Wool Twines. Cords, Ropes, Packing and Specialties
WILMINGTON, DEL.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade. **PAWTUCKET, R.I.**

(Continued from page 131.)

the crash, it is said that these mills, or representatives of these mills, were selling large quantities of yarn in 200 or 300 case blocks for 9 cents, for 12s white cops, and 12 cents for 10s to 12s combed Egyptian. The salesmen started up the Mohawk Valley, and sold much yarn. They got as far as Amsterdam, and were then recalled. There must be some truth in this report, because we have seen the bills with the prices stated thereon. The Cohoes contingent are much excited, because they were not let in on the "snap." Most of the trade this year has been on white and Egyptian yarn; few orders have been placed for silver gray or Jauger yarn. We notice a great irregularity of prices at which yarn has been sold. Some yarn has been sold to some mills, 1 and 2 cents cheaper than at others for the same yarn. The knitters are all manufacturing the cheapest class of garments that can be gotten up. Buyers demand cheap trash and they are most assuredly getting it. The fleece-lined garments are having a fair demand, and also some business is doing in the rubber boot lining trade. Hosiery manufacturers are getting some orders. The condition of both the knitters and spinners is very unsatisfactory. The spinners are running as light as possible, and will have better price, or will not run. Fine combed Egyptian yarn is not selling well. Prices remain the same and are nominal.

The Philadelphia Yarn Market.

The scarcity of cotton, especially at local points in the South, has occasioned a sharp advance in most yarns made in that section, and together with the financial difficulty of some Eastern mills, has induced considerable firmness in all yarns.

We quote the following as about market prices:

(Continued on page 135.)

KERR THREAD CO.
—SPINNERS OF—
Fine Combed Sea Island COP SINGLES
All Numbers, 30s to 150s.
Fall River, Mass.

J. D. KENNEDY, Lessee
North Athens Cotton Mills,
Manufacturer of
COTTON WARPS AND YARNS
in numbers from 4s to 14s.
ATHENS, - - TENN.

ABEGG & RUSCH,
WORSTED YARNS
Dry Spun, Nos. 36s to 100s.
COTTON YARNS
Nos. 12s to 120s.
92 GRAND ST., NEW YORK.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

EICHMANN & STERNBERG
488-492 Broadway, NEW YORK.
COTTON WOOL SILK YARNS For Weaving Knitting or Embroidering.
HARNESS TWINES.

WOOLEN AND MERINO
YARNS. Special line for Bicycle and Golf Goods in all shades For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

HADLEY
SPOOL COTTON AND FINE YARNS
COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 ply cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.

SILK LUSTRE COTTON YARNS
In single and two or more plys. This yarn retains its lustre through all usages and is increased in strength twenty to forty per cent.

High Grade COTTON WARPS and NOVELTY YARNS.
Printers of Cotton, Wool and Worsted Yarns.
The J. R. MONTGOMERY CO.,
. . . . . WINDSOR LOCKS, CONN.

MALCOLM MILLS CO.,
MANUFACTURERS OF
Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.
Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

PLAIN AND FANCY PATTERN
Cotton Warps,
WHITE, MIXED AND COLORED.
For SATINETS, BLANKETS, ETC.
WHITTIER COTTON MILLS,
LOWELL, MASS.

NOVELTY TEXTILE PRINTING CO., Inc.,
Printers and Embossers of Textile Fabrics.
NOVELTIES IN GOLD EFFECTS, ETC.
525-531 West 24th St., New York.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

(Continued from page 133.)

WARPS.

20s	13½ to 14 cts.
22s	14 cts.
26s	14½ cts.
12/2	13½ to 14 cts.
14/2	13½ to 14 cts.
30/2 Eastern	16½ to 19½ cts.
30/2 Southern	17 to 17½ cts.
30/1 "	15 to 16 cts.
30/1 Eastern	18½ cts.
14/1 Southern	12½ to 13 cts.
16/1	13 to 13½ cts.

SKEINS.

26s filling	14 cts
20s	13½ to 14 cts.
19s	13½ to 14 cts.
4s to 10s soft	12 to 12½ cts.
10s to 12s hard	11½ to 12½ cts.
12s soft	12½ to 13 cts.
14s soft	12½ to 13 cts.
20/2	13¾ to 14 cts.
16/1	13 to 13½ cts.
14/2 hard	13 to 13½ cts.

SOUTHERN CONES.

6s to 8s	12½ to 13 cts.
10s	13 to 13½ cts.
12s	13 to 14 cts.
14s	13 to 14 cts.
16s	14 to 14½ cts.
20s	15 to 16 cts.
24s	15½ to 16 cts.
26s	15½ to 16 cts.

SHUTTLE COPS.

6s and 8s	12½ to 13 cts.
10s	13 to 13½ cts.
12s	13 to 13½ cts.
16s	13½ to 14 cts.
26s	14 to 15 cts.
40s	17½ to 18½ cts.

MIXED COLORED CONES.

6s and 8s	14 to 14½ cts.
10s	14½ to 15 cts.
12s	15 to 15½ cts.
14s	15½ to 16 cts.

EASTERN COPS.

12s shuttle	14 to 14½ cts.
10s to 12s hosiery	14 cts.
14s to 16s	14 to 14½ cts.
20s	16 cts.
24s	16½ to 17 cts.

SKEIN.

8/3 carpet	12 to 12½ cts.
8/3 slack	12 cts.
9/4 slack	12 cts.
10s double reeled	12½ cts.
16/3 slack	13½ to 13¾ cts.
16/4 medium	13½ to 13¾ cts.

Eastern skein, 1-2 c. above cops.

(Continued on page 137.)

B. F. BOYER & CO.,

Successors to GEORGE SHIMER & BOYER,

HOSIERY YARNS,
In Wool, Merino and Worsted.

GOLF YARNS,
In Wool and Worsted. Also carry a full line

BUNDLE YARNS
For the Jobbing Trade.

516 Market St., Philadelphia.
MILLS, CAMDEN, N. J.

PORTER BROTHERS & COMPANY

Commission Merchants,
Trimmings, Buttons and Knit Underwear.
Sole Agents for
John Paton, Son & Co.,
OF ALLOA, SCOTLAND.
Specialties:
SCOTCH MIXTURES
For Sweaters, Golf and Bicycle Hose, Mitts, Gloves, etc.
78 & 80 Worth St., New York.
72-82 Lincoln St., Boston.

BOTANY WORSTED MILLS,

PASSAIC, N. J.

Fine Worsted Yarns,
— AND —
Fine Woolen Yarns
— IN THE —
GREY, COLORS and MIXTURES.

Cohannet Mills,
TAUNTON, MASS.
Spinners of High Grade
HOSIERY YARNS OF EVERY DESCRIPTION.
Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:
Broadway and Jefferson Avenue,
CAMDEN, NEW JERSEY.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.
Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

The Competition of Foreign Goods

On staple and plain fabrics under present tariff conditions makes it almost impossible to make any money, and the only hope of profit in making Dress Goods, Cloakings and Cassimeres seems to be in using

MOHAIR OR NOVELTY YARNS.

In the United States we are the only manufacturers from raw materials to finished product who make such yarns ONLY.
Perhaps we can be of use to you.

CRANSTON WORSTED MILLS, Bristol, R. I

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

"Get Our Prices."

T. BROPHY'S SONS,

DYERS OF ALL KINDS OF YARN AND COTTON WARPS.

KENSINGTON DYE WORKS.

Jasper Street, above Clearfield Street,
PHILADELPHIA.

FAST FANCY COLORS.

We make a specialty of dyeing **Mode** and **Tan** shade on hosiery and yarns, as also all other fancy shades. **Colors absolutely fast.** For particulars address

OAKDALE DYE WORKS,
913 W. York St., Philadelphia, Pa.

(Continued from page 135.)

Eastern cones, 1-2 c. to 1 1-2 c. above cops.

Egyptian, carded, 4 c. above white.

Egyptian, combed, 4 c. above carded.

Wool spun yarn very slow sale. Prices nominal for cotton yarns, and spinners are generally trying to run their production on wool stock. We quote:

20 cut black cotton cops	13½ to 14½ cts.
12 " " " "	13 to 13½ cts.
15 " " " "	13 to 13½ cts.
22 " " " "	14½ to 15 cts.
18s to 20s white	14 cts.

The carpet trade is fairly busy. Prices on wool yarns, as well as cotton, have advanced, and manufacturers are expecting the tariff bill to improve their business.

Recent Sales of Mill Stocks.

	Highest.	Lowest.
Arlington	100¼	98
Massachusetts	109	101¼
Naumkeag	60	55
Bates	113¾	113½
Hamilton	850	850
Lyman	73¼	70⅛
Union	170	170
Atlantic	60½	59¾
Assabet (woolen)	118	117¼
Edward	145	145
Great Falls	135	135
Laconia	600	595
Manchester	103⅜	101⅛
Merrimack	1117½	1117½
Nashua	526¼	526¼
Cornell	115	115
Sagamore	105	105
Amory	136⅛	135
Continental	25	25
Hillsborough (woolen)	70	70
Merchants	100	100
Mechanics	85	85
Amoskeag	1400	1400
Lancaster	308¾	308¾
Lawrence	117	117
Pepperell	1275	1275
King Phillip	100	100
Appleton	501¼	501
Middlesex	105	105
Chicopee	62½	62½
Lowell	537½	537½

YARNS All Numbers and Qualities.

HOLLAND & WEBB,
478 Broadway, New York.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO. 47 LEONARD ST., NEW YORK.

LARGEST IN THE WORLD. ESTABLISHED IN 1870.

THE F. MUHLHAUSER CO.

FINE SHODDIES, CAPACITY: 10,000,000 lbs. per Annum

Rings, Threads, Botany Yarns, Etc.

BRANCH OFFICES: 143 Federal Street, Boston. 7-9 Grand Street, Troy, N. Y. 34 No. Front Street, Philadelphia, Pa.

CLEVELAND, OHIO.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silks for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479, and 481 Broome Street, NEW YORK.
79 Chauncey Street, BOSTON.
186 Franklin Street, CHICAGO

WILLIAM RYLE & CO.,

RYLE

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

Boston Finishing Works

WILLIAMSTOWN, MASS.

BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Goods. Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flanneletts, and all descriptions of Dyed Goods.

NAPPING A SPECIALTY.

Being equipped with the French and other Foreign and Domestic Napping Machines, we are prepared to give any kind of Nap required, including the French FlannelFinish.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
28 BAYLEY ST., PAWTUCKET, R. I.

ESTABLISHED 1869.

JAMES BOWER'S SONS, Ltd.

Manufacturers of

ALL GRADES AND COLORS OF

Wool Shoddies and Worsted Waste,

CHESTER, PA.

Capacity One Million pounds per year.

M. B. SCHWAB, Pres. D. W. SCHWAB, Sec.
H. RAWITSER, Treas. ED. GLUECK, Gen. Mgr.

Riverdale Woolen Co.,

MANUFACTURERS OF

SHODDIES

OF EVERY DESCRIPTION.

Capacity 7,000,000 pounds per annum.

Custom Carbonizing and Garnetting a Specialty.

RIVERDALE, NORTHBRIDGE, - MASS.

New York Office: 140 Duane Street.

RICHARD T. SULLIVAN,

WOOL EXTRACTS,

And Fine All Wool Shoddies.

NEWTON LOWER FALLS, Mass.

And 155 Federal Street, Boston, Mass.

John H. Lyon & Co.,

IMPORTERS AND DEALERS IN

Woolen Rags, Waste, Wool and Hair.

All Grades of Paper Stock Bought.

10 & 12 READE ST., NEW YORK.

CHAS. J. WEBB & CO.,

Foreign and Domestic

WOOL, HAIR and NOILS

142, 144 & 152 to 156 N. Front St.,

PHILADELPHIA PA.

JAMES E. DALY

Manufacturer of

WOOL EXTRACTS and SHODDIES,

P. O. Box 395,

Paterson, N. J.

Fancy Colors a Specialty. Long Distance Telephone.

FOWLES & CO.,

Importers and Dealers

WOOLS, NOILS, HAIR,

Shoddies, Waste, Flocks, Etc.

106 Church St., Philadelphia.

Carbonizing and Scouring.

A specialty with us is the Carbonizing **Fine Stock**, including **Australian, Cape and South American Wools, Noils, etc.**

Kennebec Woolen Mills, **2025 Naudain St.,**

JOHN LUNN, Proprietor. **PHILADELPHIA, PA.**

THEO. A. DUROSS, Wool Sorter and Scourer.

Having doubled my former capacity, I am now prepared to scour the largest lots in the quickest possible time. Especial attention given to western shippers. All wools covered by insurance while in my possession I deliver wool free of charge in Philadelphia. Immediate returns made on sample tests. **All wools dried by cold air draft.** Best of References. Correspondence Solicited.

Kensington Ave. and Huntingdon St., - PHILADELPHIA, PA.

Represented by S. MARTIN HENRY.

GLUTROSE.

Glutrose Sizing will effect a saving of 25% to 30% of flour or starch.

Glutrose Sizing will penetrate the goods better, go farther and finish better than anything else, adding much to the strength, stiffness and lustre of the goods.

Glutrose Sizing has no offensive odor, and goods prepared with it will retain their condition better under severe climatic changes.

Glutrose is a neutral compound and **will not injure colors.**

Manufactured solely by AMERICAN GLUTROSE WORKS,

Office, Penn Mutual Building, - 925 Chestnut Street, - PHILADELPHIA, PA.

FIRE DEFIED!! **By The American Fire-Resisting Paint.**

A building protected with these goods becomes practically Fire proof.

An ocular demonstration of the fire-resisting qualities of this paint and kalsomine will be given at our office to anyone interested. Samples, and information furnished from those who have used this paint successfully.

THE AMERICAN FIRE-RESISTING PAINT CO., 17 Broadway, New York, N. Y.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

VICTOR KOECHL & CO. 79 MURRAY ST. NEW YORK.

SOLE AGENTS FOR

FARBWERKE, formerly MEISTER, LUCIUS & BRUENING, HOECHST o | M.; A. LEONHARDT & CO., Muehlheim o | M.

BRANCH OFFICES:

Boston, Mass., 138 Milk St.; Philadelphia, Pa., 39 N. Front St.; Providence, 45 S. Main St.

PROVIDENCE DYE WORKS.

Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

FIRTH & FOSTER CO.,

OFFICES: **Philadelphia, 546 Bourse Building.**
New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

R. GREENWOOD & BAULT,

GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

BAY STATE DYEING AND FINISHING CO.,

Yarn and Piece Dyeing a Specialty.

NORTH ANDOVER, DEPOT, - - MASS.

JOHN J. KELLER & CO.,

104 and 106 MURRAY STREET,
NEW YORK.

220 Church St., Philadelphia. 135 Pearl St., Boston.

Aniline Colors,
Dyewood Extracts,
Sumac and
Nutgall Extracts.

FAST COLORS for wool dyeing, one dip cotton colors, novelties and specialties for calico printing.

—— MANUFACTURED BY ——

JOHN R. GEIGY & CO., Basle, Switzerland.

WM. J. MATHESON & CO., Ltd.

IMPORTERS AND MANUFACTURERS OF

DYE STUFFS

New York,
Boston,
Philadelphia,
Providence,
Charlotte, N. C.,
Montreal, Canada.

FARBENFABRIKEN OF ELBERFELD CO.

77 William Street, New York. *68 Batterymarch St., Boston.*
11 North Front Street, Phila. *145 Kinzie Street, Chicago.*

Aniline Colors, Alizarine, Dyestuffs.

SOLE IMPORTERS OF THE WELL KNOWN ALIZARINE AND DIRECT DYEING BENZIDINE COLORS.

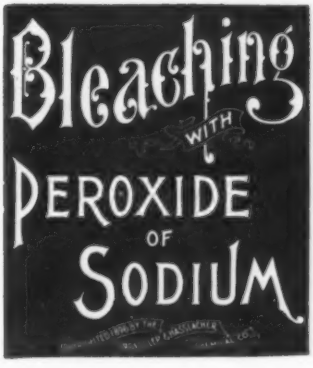
—— MANUFACTURED BY ——

FARBENFABRIKEN, formerly FRIEDR. BAYER & COMPANY, Elberfeld and Barmen, Germany.

Sole Agents of the Hudson River Aniline Color Works, Albany, N. Y.

BLEACHERS:

WRITE FOR PAMPHLET ON:



Having started our Peroxide Works at Niagara Falls, we are prepared to execute the largest contracts promptly, and at greatly reduced prices.

The Roessler & Hasslacher Chemical Company,

100 William Street, Woodbridge Building,
NEW YORK.

THE STAMFORD MANUFACTURING CO.

MANUFACTURERS OF

CUT and GROUND DYEWOODS,

Dyewood Extracts and Liquors,

FLAVINES.

Importers of CHEMICALS and DYESTUFFS.

133-137 Front Street, - New York.

NEW COLORS

Of the St. Denis Dyestuff and Chemical Company.

BROWN S D P, . . .

New Direct Dyeing Brown for Cotton,

Specially recommended to Hosiery Manufacturers.

SOUDAN BLACKS FOR WOOL,

Dyeing in an Acid Bath.

SYKES & STREET,

New York. Boston. Philadelphia.

SOLE U. S. AGENTS.

O. S. JANNEY & CO.,

IMPORTERS OF

INDIGO, CUTCH, GAMBIER, SICILY SUMAC, ANILINES, ETC.

AND DEALERS IN

Dyestuffs, Extracts and Chemicals.

No. 70 Kilby Street, BOSTON.

No. 8 and 10 Letitia Street, PHILADELPHIA.

New York and Boston Dyewood Company,

— MANUFACTURERS OF —

DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for

ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.

Specialties for Wool, Silk and Cotton.

CHROMANIL BROWNS.

New direct dyeing colors of unusual brilliancy and strength, producing fast cutch shades by treatment with Chrome and Bluestone.

NEW YORK: 55 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
BOSTON: 117 HIGH ST. HAMILTON, ONTARIO.

A. KLIPSTEIN & COMPANY,

122 PEARL ST., NEW YORK.

Chemicals and Dyestuffs,

ANILINE COLORS.
FAST COLORS FOR WOOL.

BRANCHES:

50-52 North Front Street, Philadelphia, Pa.
283-285 Congress Street, Boston, Mass.
124 Michigan Street, Chicago, Ill.

American Aniline Colors FOR Cotton, Wool and Silk.

THE HANNA-SCHOELLKOPF CO., Philadelphia.

New York. Established 1865. Philadelphia.

ANCHOR COLOR MANUFACTURING CO.,

HAVANA COLORS FOR COTTON.

ALIZARINE AND MAZARINE COLORS for Wool, Yarn and Piece-Goods.

One-Dip Blacks and One-Dip Blues for Mixed Goods.

Lactic Acid, Alizarine Mordant, Archil Liquor, Cudbear, Extract Indigo, Indigotine

ACID BLACKS.

462, 464, 466 Cherry Street, New York.

PHILADELPHIA Office: 109 N. Front Street.

C. BISCHOFF & CO.,

87 and 89 Park Place, New York. Branches, 110 Walnut St., Phila. 104 Broad St., Boston.

Aniline and Alizarine Colors, Dyestuffs, Chemicals,

ANILINE OILS AND SALTS.

LATEST SPECIALTIES.

Cresylblue,	OB pat'd.	For Cotton: absolutely fast to Sunlight.	Thio Versuvine,	3BB.	One dip for cotton and mixed goods, wool and cotton silk and cotton.
"	BB "		" Brown,	BB.	
"	RR "		" Yellow,	R.	
Cresylviolet	"		" Orange,	G.	

Naphtazine Blue (Pat.)—a fast acid Navy Blue for Wool.

FAST DIRECT BLUES, Pat'd. for Cotton and Mixed Goods, Wool and Cotton, Silk and Cotton.

FAST DIAZOTABLE BLACKS, PAT'D.

Established 1834. H. G. JOHNSON, Proprietor.

Wm. G. Johnson Co.

Manufacturers of

DYEWOODS

Logwood Extracts,
Ground and Bolted Camwoods
And other Fancy Woods.

All Goods Warranted Uniform.

Long Distance Telephone. UNCASVILLE, CONN.

Fuller's Earth without Grit,

IMPORTED SOLELY BY

A. de RONDE & CO.,

254 FRONT STREET, NEW YORK.

Woolens washed with Patent Refined Fuller's Earth are much more durable and handle much softer than those cleansed by soaps and other means.

For practical proof of these facts address as above, or

H. N. GARRETT, A. M., INST. C. E.,
101 Sydney Place, Bath, England.

Proprietor of the Midford Fuller's Earth Refining Works.

NASHOBA COMPANY, AYER, MASS.

MANUFACTURERS OF

TRADE— **FANKHAUSINE.** —MARK

A CLEANSING MORDANT FOR COTTON DYEING, PRINTING AND BLEACHING.

FANKHAUSINE Saves Time, Labor, Fuel and Dyestuffs, gives more even brighter, faster colors and softer goods.

By using FANKHAUSINE cotton is dyed directly without boiling out.

SAMPLE AND CATALOGUE UPON APPLICATION TO

NASHOBA COMPANY, - - AYER, MASS.

F. E. ATTEAUX & CO.,

Manufacturing Chemists.

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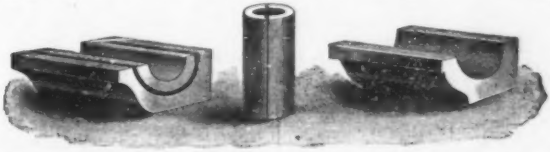

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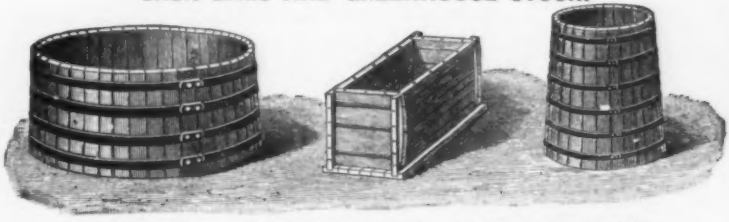

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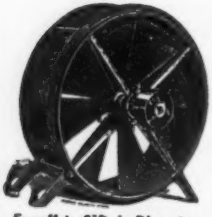

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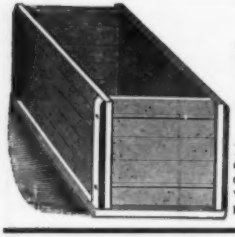

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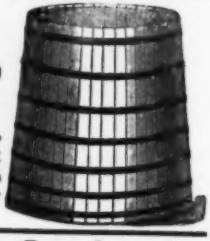

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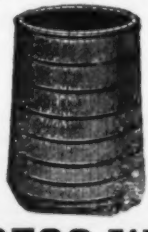

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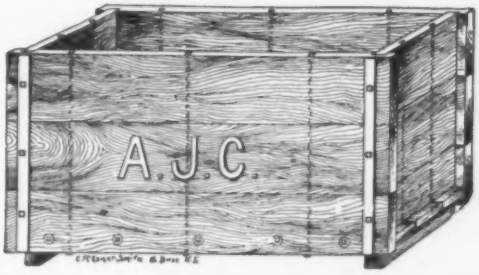

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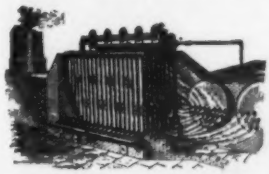

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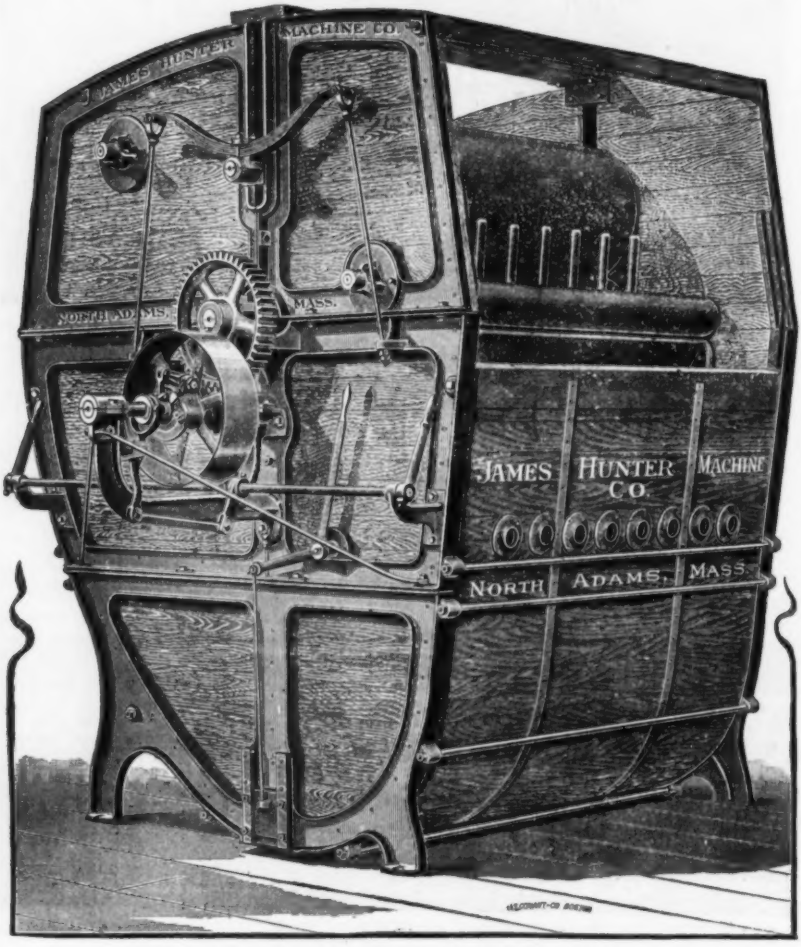

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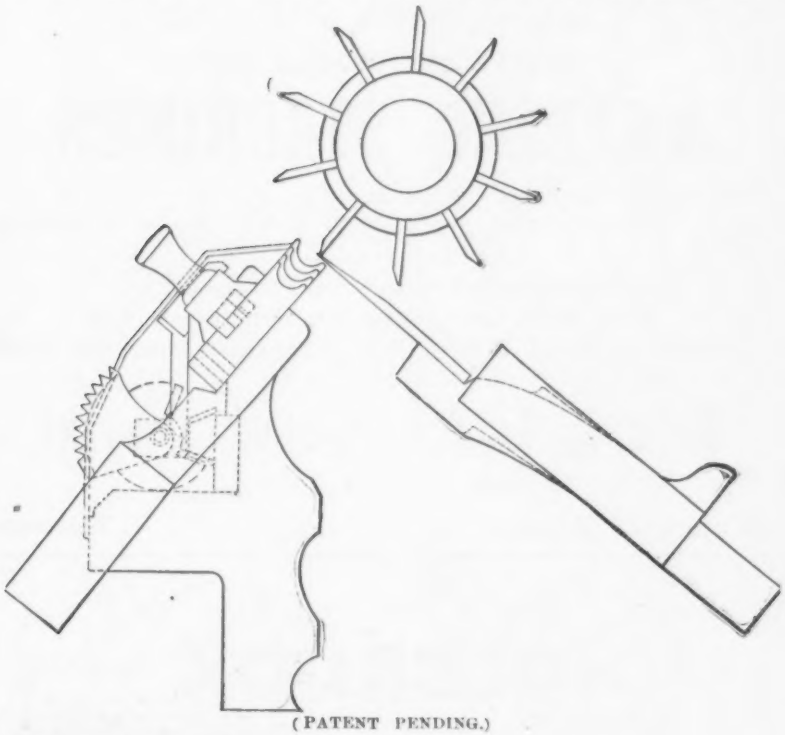

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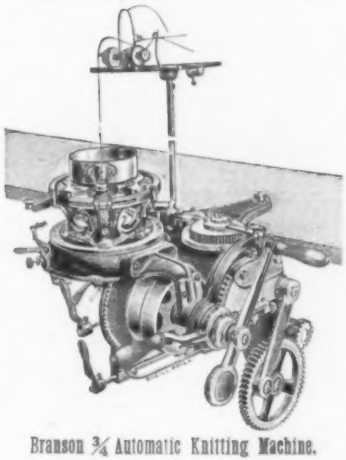

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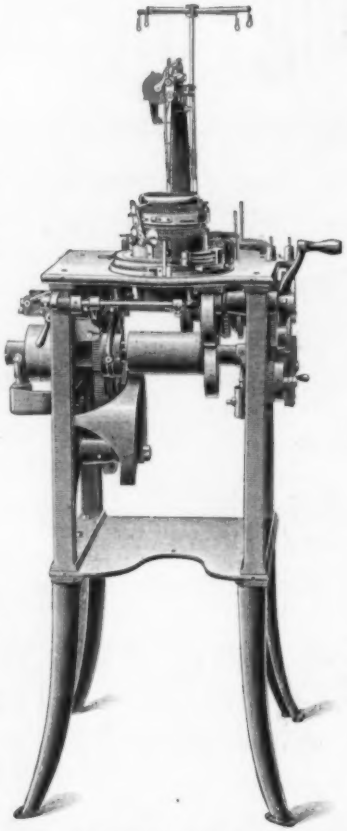

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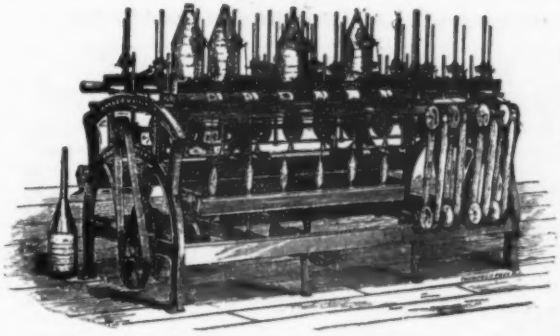

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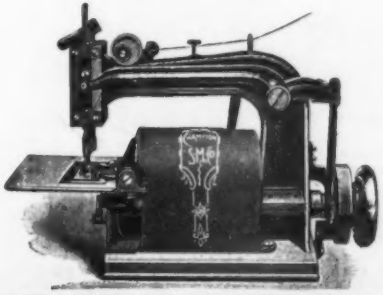

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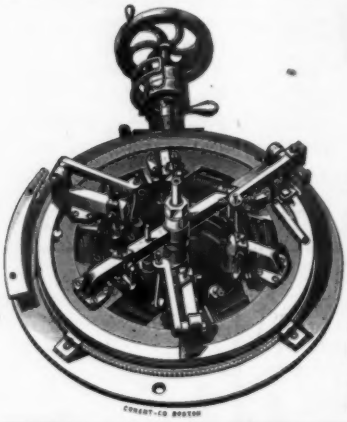

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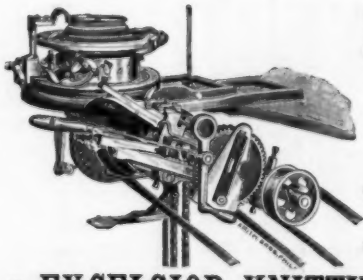

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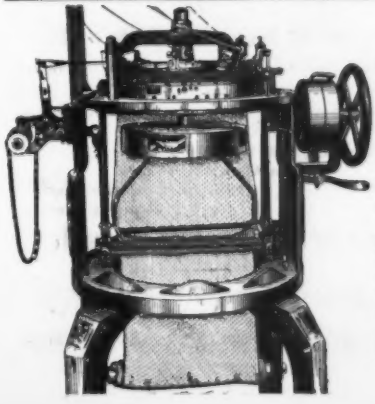

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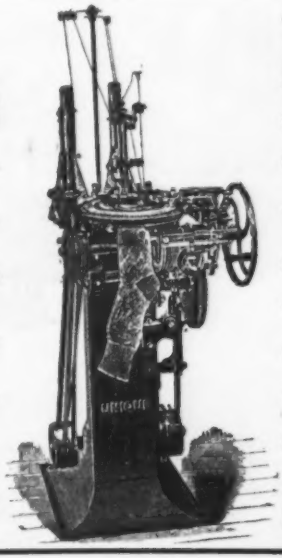

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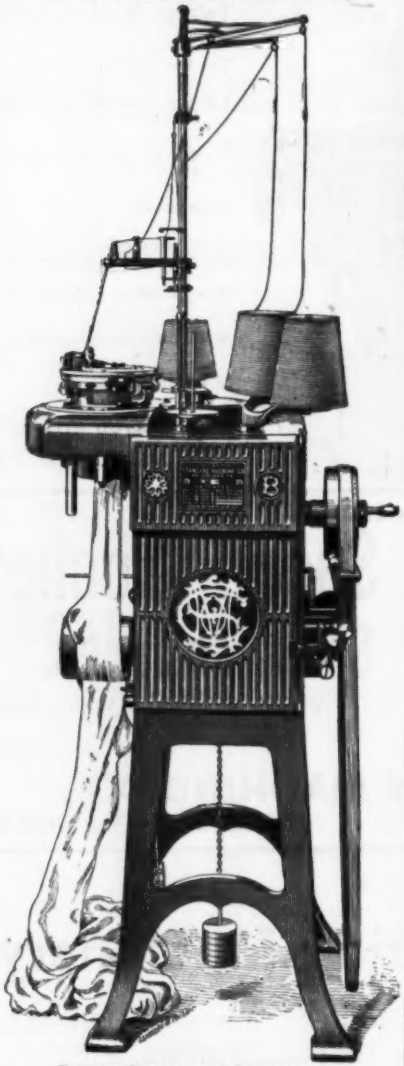

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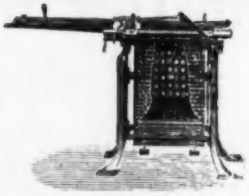

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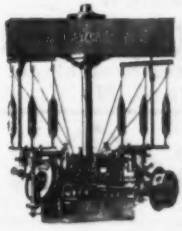

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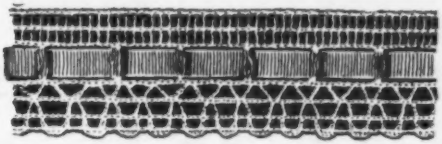
Lace  **Edgings**

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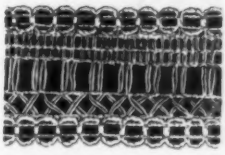

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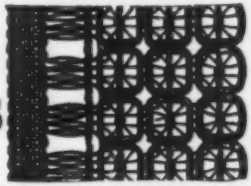

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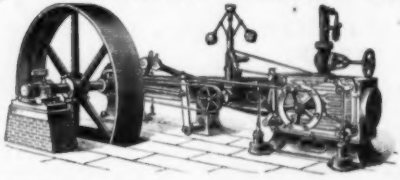

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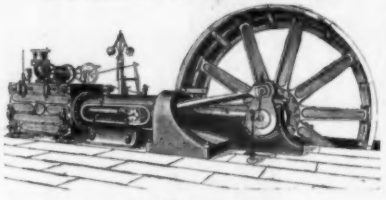

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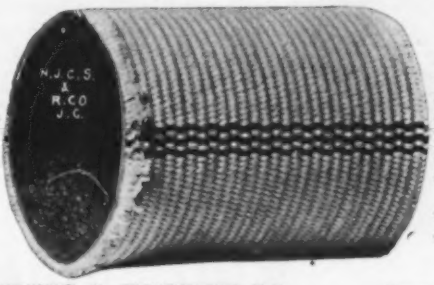

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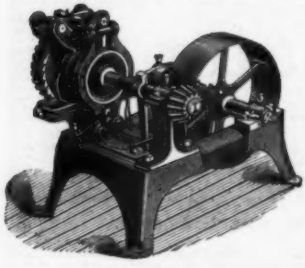

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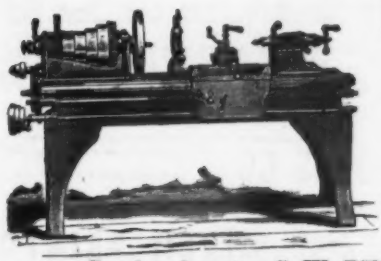

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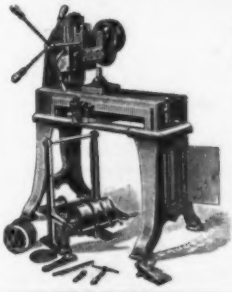

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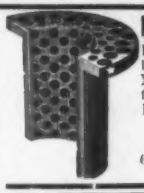

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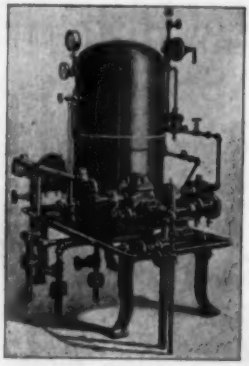

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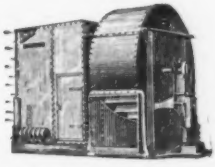

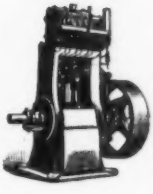

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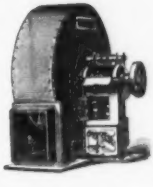

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